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ABSTRACT

This 1970-71 study compared the relationship of pronunciation to spelling, in English and Spanish, for Mexican American second graders in Corpus Christi and San Antonio, Texas. The investigator selected 78 children from 5 participating schools: 2 in San Antonio and 3 in Corpus Christi. The public schools from which the samples were drawn are located in educationally, economically, and culturally similar neighborhoods. A second aspect of the research compared the type of instruction, bilingual or monolingual, the former represented by the Corpus Christi sample, the latter by San Antonio. The Gloria and David Oral Bilingual Test -- Spanish and English was used as the assessment instrument. Main conclusions of the study were that: the sample involving bilingual instruction did significantly better in English phonology; other factors besides sex, age, home language, number of siblings, and type of instruction may have influenced test results. It was recommended that bilingual instruction be used to teach children whose home language is Spanish. The appendices included such things as taped spelling tests in English and Spanish and Spanish and English test in phonemic notation. (KM)

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THE INFLUENCE OF PHONOLOGICAL CHARACTERISTICS UPON ORTHOGRAPHY IN MEXICAN-AMERICAN SECOND GRADERS

by

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DISSERTATION
Presented to the Faculty of the Graduate School of
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of the Requirements
for the Degree of

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S. A.

The University of Texas at Austin
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CHAPTER I

INTRODUCTION TO THE PROBLEM

The decade of the sixties saw the federal government actively supporting new ways to improve the quality of education, particularly in the urban centers. Time and again the results of studies conducted in inner-city schools have shown a language deficiency that prevails among pupils in this setting. This deficiency may be a contributing factor to school failure and one of the causes for pupils dropping out of school.

A recent report of the U.S. Commission on Civil Rights indicates that schools in all five southwestern states are "failing if the performance of students is used as the test."[1] The report further states that 14 percent of the Mexican-American students have dropped out of school by the eighth grade and by the time of high school graduation, 40 percent have dropped out. By the fourth grade, 25 percent of the Texas Anglos are reading below grade level while 51 percent of the Mexican-Americans and 56 percent of the black students are below grade level.

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[1] "The Unfinished Education: Outcomes for Minorities in the Five Southwestern States," a report of The U.S. Commission on Civil Rights. Corpus Christi Caller, December 8, 1971, p. B-1.

Importance of the Study

The deficit of knowledge (including the skill of reading) which prevails among children in ghetto schools has been attributed, in part, to the disparity existing between the language used in the home and the language used in the school setting. The Mexican-American's main educational problem, if he speaks Spanish at home, is his Spanish dialect which is different from the English dialect used in the school. He may have trouble understanding spoken English and also speaking it and in general getting along in school where only an English dialect is used.

Although language is used primarily to communicate orally, its secondary or written form merits special consideration, especially in the school setting. For the most part, educational progress is measured in school through writing. Writing, then, is a language skill that is essential in the educational process.

Spelling is a tool for writing, and one of the basic requirements for writing is that words must be spelled correctly. A person may be forgiven for speaking English with a marked accent, but in school, mistakes in spelling are not taken lightly.

The traditional method of teaching spelling relies upon visual and hand learning approaches. But much more can be involved in the spelling act than to learn each word in a separate learning act. Recent research stemming from the Hanna study has found a relationship between dialect and spelling.[1] It is suggested by Hodges that a pedagogical method based upon oral-aural clues to spelling may well prove to be more efficient and powerful than present methods.[2] The need for data showing the relationships existing between oral language and spelling among Mexican-American second grade pupils prompted the design of this study. Research on how this child's phonological characteristics are related to spelling should be a step toward the intelligent development of programs for improving the language performance of these bilingual speakers of English. According to Horn, the data analyzed in the Stanford University study have been used to suggest word selection and gradation according to linguistic principles in order to make possible--an almost unlimited correctly spelled writing vocabulary.[1]

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[1] Paul R. Hanna and Jean S. Hanna. Phoneme-Grapheme Correspondence As Cues to Spelling Improvement. Washington: U.S. Department of Health, Education and Welfare, 1966.

[2] Richard E. Hodges and E. Hugh Rudorf, "Searching Linguistics for Cues for the Teaching of Spelling," Elementary English, May, 1965, p. 531.

Statement of the Problem

This study compares selected phonological features with their corresponding graphemic realizations for a group of second grade children attending public school in San Antonio and Corpus Christi, Texas. Mexican-American children make up almost the entire population studied The investigator made pronunciation and spelling comparisons for both English and Spanish; the phonological variations which are being examined in English and in Spanish are those demonstrated in response to the Gloria and David Bilingual Test which includes both languages.[2] Chapter III contains a detailed description of the test used.

---

[1] Thomas D. Horn, "Spelling," Encyclopedia of Educational Research. New York: The Macmillan Co., 1969, p. 1286.

[2] W. R. Devine. Gloria and David Bilingual Series Test. Language Arts, Incorporated, 1205 West 34th Street, Austin, Texas.

Design of the Study

As part of The University of Texas at Austin Teacher Corps Project during the 1970-71 school year, the university completed an oral language assessment of over seven hundred linguistically different learners in San Antonio, Texas. Of the five schools participating, three have enrollments of predominately Spanish-surnamed students. To minimize the socioeconomic variable and because of their proximity to each other, the investigator selected Brewer and Storm schools for this study. They are approximately ten city blocks apart and serve neighborhoods considered educationally deprived and culturally different. Because the schools selected in San Antonio did not represent bilingual instruction in English and in Spanish, and because of the lack of both time and money, the investigator selected an additional twenty-four second graders in Corpus Christi whose curriculum included both English and Spanish as mediums of instruction. Using a table of random numbers, the investigator selected a random sample of three boys and three girls from each of four classrooms in each of three schools having Follow Through classes using a bilingual curriculum: Austin, Lamar, and Zavala, all located within ten blocks one from the other.[1]

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[1] N. M. Downie. Basic Statistical Methods. New York: Harper and Row, Publishers, 1970, p. 328.

Instrumentation

Language Arts Incorporated, Austin, Texas, developed The Gloria and David Bilingual Series Test in Spanish and English. Taylor calls it the only true oral language assessment instrument on the market.[1] The assessment instrument consists of a filmstrip made up of twenty frames. The pictures on the filmstrip are cartoon-like and they show a family made up of two parents and two children, a boy and a girl. The pictures depict one or more members of the family in the act of doing something during the span of one day. There is a tape coordinated with the filmstrip. On one track of the tape are the utterances, in English and in Spanish, that describe the action in the picture. The material is used on a television-like machine called the Teaching Assistant. Each child individually sits in front of the Teaching Assistant wearing a set of headphones through which he hears the sentences, and looks at the screen as he hears and repeats sentences that describe the actions. As he speaks, a recording is made of his voice for the purpose of analysis.

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[1] T. H. Taylor. A Comparative Study of the Effects of Oral-Aural Language Training on Gains in English Language for Fourth and Fifth Grade Disadvantaged Mexican-American Children. Unpublished doctoral dissertation, The University of Texas at Austin, 1969.

Spelling

The spelling instrument developed consisted of fifteen words in each language selected on the basis of their presence in the speaking vocabulary of the subjects whose voices had been recorded. The words contained the phonemes, by position, recorded as different 10 percent of the time by the pupils in both samples.

Questions to Be Answered

This study, comparing Mexican-American children learning through an English-only curriculum with those involved in a bilingual Spanish-English curriculum, answered the following questions:

1. How do the two samples compare as to the phonological scores and spelling scores?
2. How do the two samples compare on the variable of sex, phonological scores in English and in Spanish, and spelling score in English for both and in Spanish for Corpus Christi?

3. How do the samples compare as to the language spoken in the home and the phonological and spelling scores in English and in Spanish (for Corpus Christi)?
4. What is the relationship of the number of siblings to phonological scores in English and in Spanish and to spelling scores in English and in Spanish?
5. What are the type of spelling deviations and how do they compare between groups?
6. What are the differences and similarities among selected phonological differences and spelling deviations within groups in English and within the Corpus Christi group in Spanish?
7. What is the influence of Spanish upon English phonology and spelling?
8. What is the influence of English upon Spanish phonology and spelling?

Data Analyses

The investigator used the ANOVAR statistical computer program to produce analyses of variance. The variables analyzed for both samples were:

1. the total number of words correctly pronounced (out of a total of 15);
2. the total number of phonemes correctly pronounced (out of a total of 15);
3. the total number of words correctly spelled (out of a total of 15);
4. the total number of graphemes correctly spelled (out of a total of 15).

These analyses were done in both languages for Corpus Christi and in English with Spanish phonology only for San Antonio. In addition, this study compared the two groups on the total number of correctly pronounced phonemes in Spanish.

The investigator used also the DISTAT statistical computer program to obtain descriptive statistics based on the original fifteen words spelled for the study. The variables considered in these analyses were: age, sex, home language, sibling placement (order), and type of instruction (bilingual using both English and Spanish, or monolingual using only English).

The investigator made use of a test of proportions to determine the degree of differences and similarities among selected phonological differences and spelling deviations. The differences and similarities were studied both between samples within the same mode, and within samples between the modes, oral and written.

Because of the importance of gathering data on the phoneme/grapheme correspondence of vowels, the investigator further analyzed vowels found in words given during two additional spelling tests including:

1. eight words given in a spelling test on July 24, 1972, which showed some pronunciation deviancies during the original phonological assessment;
2. a second spelling test administered to Follow Through students in Corpus Christi, Texas on July 24, 1972. The test was made up of nonsense syllables.

The results of these tests are found in Appendix G.

CHAPTER II

REVIEW OF RELATED LITERATURE AND RESEARCH

Introduction

Institutional linguistics is that branch of linguistics that deals with the relation between a language and the people who use it. Halliday says that this branch includes the study of language communities, singly and in contact, of varieties of language and of attitudes to language. Societies, like languages, differ from each other in structured ways, and language behavior and social behavior are thus related and each provides the tools with which to understand the other.[1]

Although not one of the great languages of modern man follows racial lines, language has always been one of the major factors determining group affiliations. The variety of the language you use is determined by who you are, and Sapir speaks about an important relation existing between culture and personality.[1] Since this study is concerned with the relationship of speech to spelling among Mexican-Americans, the review of the literature focused on the following: (1) language in a social setting; (2) oral language assessment; (3) language interference; and (4) spelling.

---

[1] M. A. K. Halliday as quoted in Joshua A. Fishman (Ed.), Readings in the Sociology of Language, The Hague: Mouton, 1968, p. 139. Hereinafter this book is referred to as Readings, without renaming editor or publisher.

Definition of Terms

To reduce the meaning differences in terminology the following terms used throughout this report are defined with the understanding that usage may still vary according to different sources.

Bilingualism: The characteristic shown by a person who habitually makes use of two languages.

First Language: The language learned by the child before the age of instruction, from parents, from others, such as a nurse looking after him, or from other children.[2]

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[1] Edward Sapir, Culture, Language, and Personality. The University of California Press, 1961, p. 170.

[2] Halliday, Readings, p. 156.

Dialect: The language of a particular district or class, especially as distinguished from the standard language.[1]

Mexican-American: An American of Mexican heritage; a home-school bilingual living in a non-English-speaking environment, whether rural or urban, whose first encounter with English is in school at age six or seven.[2]

Spanish-Surnamed: A Mexican-American as described above, identifiable also by his last name.

Phoneme: A member of the set of the smallest units of speech that serves to distinguish one utterance from another in a language or dialect.[3]

Hymes[4] speaks of language as being basic to a science of man "because it provides a link between the biological and sociocultural levels." Joos[1] speaks about the speech act as having two properties which he calls the dependent and independent variables. An example of the dependent property in speech he refers to as free variation, while the independent property of speech is found in the style of the speaker. Bock[2] compares language structure with social structure, both of which have internal and external substructures. Labov makes a similar comparison when he discusses the relationships between linguistic structure and extra-linguistic social processes.[3] Greenberg says that differences between languages are derived more from differences in world view than from differences in sound and signs.[4]

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[1] The American College Dictionary. New York: Random House, 1963, p. 333.

[2] Einar Haugen, "The Bilingual Individual," in Sol Saporta (ed.) Psycholinguistics: A Book of Readings. New York: Holt, Rinehart and Winston, 1966, p. 414. Hereinafter, this book is referred to as Psycholinguistics without renaming the editor and publisher.

[3] Webster's Seventh New Collegiate Dictionary. Springfield, Mass.: G. & C. Merriam Co., 1965, p. 635.

[4] Dell Hymes, "The Ethnography of Speaking," in Readings, p. 99.

Whorf speaks about the grammar of each language as not merely being "a reproducing instrument for voicing ideas but is itself the shaper of ideas, the program and guide for the individual's mental activity, for his analysis of impressions, for his synthesis of his mental stock in trade."[1] Bock mentions two groups of scholars who are trying to find the relationships between the structure of language and that of culture:

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[1] Martin Joos as quoted in Readings, p. 185.

[2] Philip K. Bock, "Social Structure and Language Structure," in Readings, p. 212.

[3] William Labov, "The Reflection of Social Processes in Linguistic Structures," in Readings, p. 240.

[4] Joseph H. Greenberg, "Concerning Inferences from Linguistic to Nonlinguistic Data," in Psycholinguistics, p. 468.

> 1. Followers of Whorf are seeking congruencies between the language and the culture values, perception, or practices of some particular society;
>
> 2. Those who, like Pike, want to formulate unified theories of the structure of human behavior within which language appears as a special, though central, case.[2]

Any concept of group membership is useful in education if it predicts with a fairly high degree of accuracy some important things about its members. Among the various social group concepts, social class probably has the greatest usefulness. According to Deutsch, social class has more predictive value for educational purposes than religion, race, nationality background, region of the country, and every common social group identification.[3]

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[1] Benjamin L. Whorf, as quoted in Psycholinguistics, p. 464.

[2] Philip K. Bock in Readings, p. 212.

[3] Martin Deutsch and Bert Brown as qhote by Lee Rainwater and William L. Yancey, The Moynihan Report and the Politics of Controversy, Cambridge, Mass.: The M.I.T. Press, 1967, p. 82.

There is a polarization into two societies in each large city in this country. As the families in the center of town become affluent, they move to the suburbs. In 1920, the ratio of central-city to suburban population was 66:34. By 1963 the ratio had changed to 50:50. Eighty-three percent of the people moving to suburbia gave as their reasons: better schools, nicer children for playmates, and more healthy for children.[1] People who are too poor to move remain in the inner-city where acute educational problems are found. A child attending the inner-city school brings with him his cultural and economic background, his social and environmental motivation, and his self-image.

Languages, like all human activities, are subject to different kinds of pressures that arise from changing circumstances. Environmental conditions are agents for change, yet the same conditions may work against a determination to change. The slum in the inner-city is more than an economic condition; it is a social phenomenon in which the attitudes, ideals, and practices play an important part.[1] Although individuals in a democracy may not be equal at birth, because some persons are born to the ghettos and some to the suburbs, much of their inequality at maturity may be ascribed to the lack of equality of opportunity if we see opportunity and environmental conditions as partial reflections of each other.[2]

---

[1] Robert J. Havighurst, "Urban Development and the Educational System," as quoted by A. Harry Passow, Education in Depressed Areas. New York: Teachers College, Columbia, 1963, p. 26.

The Mexican-Americans living in the inner-city speak both English and Spanish; they are bilinguals for the most part. However, each of their two dialects has its place: English is learned in school and is constantly heard on radio and television; Spanish is learned at home and is the language the family uses for prayer. As an ethnic group within the inner-city's culture of poverty, Mexican-Americans cling to past traditions of closeness of family and a language and a dialect different from that of the majority.

The most acute educational problem in the Southwest is that which involves Mexican-American children.[3]

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[1] Lester D. Crow. Educating the Culturally Disadvantaged. New York: David McKay, 1966.

[2] Benjamin S. Bloom. Stability and Change in Human Characteristics. New York: John Wiley and Sons, Inc., 1954, Chapter 6.

[3] The Invisible Minority. A report, N.E.A. Washington, D.C., 1966, p. v.

Galarza says that up to one-third of the Spanish-speaking population of the Southwest lives in the metropolitan compass of 16 cities, including Los Angeles, San Antonio, San Francisco, and El Paso. A high percentage of inner-city pupils come from homes speaking a dialect of Spanish. In California the Mexican-American male labor force is over 80 percent urban; in Texas, over 75 percent; in Colorado, New Mexico, and Arizona, between 55 and 70 percent.[1]

One of the difficulties in teaching Mexican-American bilinguals is that teachers are not aware of the characteristics of their English and Spanish dialects. Since language is a form of social behavior, teachers may react to a child's language different from theirs as something strange.

> The inability of affluent-oriented teachers in American society to understand or cope with the behavior of children from economically deprived families is often of paramount importance in alienating these children from the public schools. It is this clash of value commitments that, more than any other factor, drives our Negro, Mexican, Puerto Rican, Indian,

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[1] Ernesto Galarza, et al. Mexican-Americans in the Southwest. Santa Barbara, Ca.: McNally & Loftin Publishers, 1969.

> and economically deprived Caucasian children out of the school and into the street.[1]

That Spanish spoken in the Mexican-American culture group of the inner-city is a dialect which is generally not learned in the school setting. It is not unusual to find parents who, themselves, have had at least elementary schooling in English, and who still prefer to use Spanish as a home language instead of English. There are different dialects and argots in the Spanish spoken in the inner-city which reflect the different social strata within the culture group. In the inner-city are found those Mexican-Americans who have recently arrived from rural areas; but, there are also those who have lived in the same neighborhood for generations. Those who have recently left farms to seek a better way of life in urban centers find the inner-city subculture strange even though they may be speaking essentially the same Spanish.

Wolff speaks about the interethnic relationships that reflect different attitudes within a society. He states that linguistic proximity seems to be of secondary importance in establishing and maintaining interlingual communication. The fact that a person learns or does not learn a language, even though it may be spoken in the community, may reflect a hierarchy of functional values between different languages or dialects of the same language.[1]

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[1] Nathaniel Hickerson. Education for Alienation. Englewood Cliffs, N.J.: Prentice-Hall, 1966, p. 42.

Mistakes in language are simply dialect forms carried into standard language. According to Bloomfield[1] the speech forms that people learn, even incorrect speech, are not haphazard. They are stable forms, even though people say "I seen it" for "I saw it," and a person has learned just as much in learning the former as he would have learned in learning the latter. Bloomfield goes on to say

> Since only part of the population lives in the metropolis and since, even there, different social classes communicate little, and since the language,

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[1] Hans Wolff, "Intelligibility and Inter-Ethnic Attitudes," in Dell Hymes (Ed.), Language in Culture and Society. New York: Harper & Row, Publishers, 1964, p. 440. Hereinafter, this book will be referred to as Language without renaming editor and publisher.

[2] Leonard Bloomfield, "Literate and Illiterate Speech," in Language, p. 393.

> closely tied up with the literary language, tends to become archaic (that is, to ignore the changes of the last generations), it results that only relatively few children speak Standard Language as their mother tongue.[1]

The situation may be still worse for Mexican-Americans, for they speak an entirely different language. If they are recent arrivals from rural areas it may be that they are using archaic forms in Spanish such as truje, vide, and asina, which were standard Spanish centuries ago but which have since evolved into traje, vi, and así, respectively.

Bilingualism

Bilingualism indicates the existence "of two language communities," and it is the property of the individual and of the group.[2] Because language is part of the social and cultural setting, bilingualism is more than a personal phenomenon. Fishman states that every natural bilingual population makes differential use of its several languages and this differential use serves both to integrate the society as well as to preserve its bilingualism.[1]

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[1] Leonard Bloomfield in Language, p. 391.

[2] William F. Mackey, "The Description of Bilingualism," in Readings, p. 554.

Language contact and culture contact generally result in language transfer; however, when two languages are in contact, they are not in the same cultural contact. Speaking about situations where more than one language are spoken, Steward states that the situation is stable when the different linguistic systems are geographically, socially, and functionally noncompetitive because "no linguistic conflict is involved if the languages are used by different ethnic groups or if they serve different purposes."[2]

Language maintenance is a term used to indicate adhering to linguistic customs different from those of a dominant group. An example of maintenance is found in the Mexican-American ethnic group which continues to speak Spanish in spite of having had several years of schooling in English. The reason may be, however, that a combination of a Spanish speaker and a Mexican-American topic almost always demands the use of Spanish in a normal situation. This theory is advanced by Ervin-Tripp in discussing Japanese bilinguals.[1]

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[1] Joshua A. Fishman, "Bilingualism, Intelligence and Language Learning," The Modern Language Journal, 49 (April, 1965), 213-221.

[2] William A. Steward, "A Sociolinguistic Typology for Describing National Multilingualism," as quoted in Joshua A. Fishman (Ed.), in Readings, p. 530.

Hofman speaks about retentiveness in a language in studying language transition in some Lutheran denominations. He states that Lutheran churches since the Protestant Reformation had been ethnic in character. There has occurred a transition from the use of German to the use of English, inexorably, although the transition has not been even in different places and at different times.[2] The Mexican-American community, similarly to the Lutheran group, represents a culture group in which the Catholic Church is closely linked to its ethnicity. The Catholic Church has maintained national churches in the same way that the Lutheran Church has. These churches cater to the needs of a population which is linguistically different. So it is that the religion of the Mexican-Americans has been instrumental in maintaining their linguistic and social stratification.

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[1] Susan M. Ervin-Tripp, "An Analysis of the Interaction of Language, Topic, and Listener," in Readings, p. 203.

[2] John E. Hofman, "The Language Transition in Some Lutheran Denominations," in Readings, p. 633.

Diebold speaks about the interlingual identification which the bilingual undertakes, unconsciously, as he acquires models of speech from a second language and introduces them into his first language. The type of interference that can occur from one language to the other includes:

1. Switching, the alternate use of the two languages;
2. Overlapping or interference of the two languages;
3. Integration, the regular use of materials from one language to another.[1]

Lambert states that linguistic minority group members in a Maine community face a conflict of cultural allegiances which affects their skill in both their languages. "Substantial evidence indicates that their attitudes toward their own linguistic culture group can affect their adoption or rejection of their own native language."[2] It may well be true also of the Mexican-American child.

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[1] A. Richard Diebold, "Incipient Bilingualism," in Language, p. 141.

[2] W. E. Lambert, et al. "A Study of the Roles of Attitudes and Motivation in Second-Language Learning," in Language, p. 473.

Interference

There is speech interference and there is language interference: the former [illegible] like sand carried by a stream while the latter is sedimented sand, deposited on the bottom of the lake. One occurs in the speech of a person as he speaks; the other, having frequently occurred in the speech of bilinguals, has become habitualized and established, says Weinreich.

He goes on to say that the physical resemblance of a phoneme in both languages tempts the bilingual to identify the two phonemes astride the limits of the two languages.[1] The most persistent problems faced by a student are not those problems created by radical differences, but the problems that are due to a partial similarity or overlap between two languages, "which the student extends by analogy into an area in which the overlap does not exist," states Politzer. He adds that interference is not due to lack of learning but rather it is built into the learning mechanism of the individual.[2]

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[1] Uriel Weinreich, "Mechanisms and Structural Causes of Interference," in Psycholinguistics, pp. 381-393.

[2] Robert L. Politzer and Charles N. Staubach. Teaching Spanish: A Linguistic Orientation. New York: Ginn & Company, 1961, p. 98.

In some dialects of the North and West Coast there is no contrast between /a/ and /ɔ/, so that such words as stock and stalk, cot and caught are pronounced alike and may be difficult to spell. Similarly, the Spanish-speaking child will hear sheep, ship, cheap, and chip alike and will tend to spell them alike.[1]

In English one is accustomed to listen for a plus juncture (/+/ juncture) which signals a word boundary. This juncture is seldom present in Spanish, where generally linking occurs between words, within phrases, or in breath groups. Linking may make it difficult for a child taking a spelling test: when the word is pronounced in isolation it may be pronounced differently than when it is pronounced within the sample sentence, and thus create doubt in the mind of the speller as to the way the word is spelled.

Not every gap in proficiency can be attributed to interference, because not all unilingual persons achieve the same score in a language proficiency test, says Weinreich. No easy way of measuring or characterizing the total impact of one language on another in the speech of bilinguals has been, or probably can be, devised, he continues, adding, "In trying to compare the degree of interference of one language upon the other the only possible procedure is to describe the various forms of interference and to tabulate their frequency."[1]

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[1] Muriel R. Saville and Rudolph C. Troike, A Handbook of Bilingual Education, rev. Washington: T.E.S.O.L., 1971.

Oral Language Assessment

All the educational programs can benefit from assessment, and language learning is not an exception. It is necessary to find out the language competence of a child in order to determine the best course of action to take in teaching him. Many instruments have been developed for assessing linguistic performance, although oral language assessment has gained prominence particularly in regard to the education of the educationally and culturally deprived.

Most tests, according to Bordie, measure many of the same things: language mechanics; recognition of correct form; vocabulary; reading comprehension; usage;

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[1] Weinreich, in Psycholinguistics, p. 386.

parts of speech; sentence types, editorial revision; and recognition of differences in style.[1] The tests are, for the most part, printed and are not meant for measuring oral English. Some tests measure the ability to learn; others measure the amount of actual learning that takes place. Most of the tests accept only one correct response as an answer, one that is usually written in standard English. Regardless of geographic area, low socioeconomic level students have a public language which they use at home or at play less like that of the formal language used in the school and in print that is the language of the middle socioeconomic level students.[2]

Success in school is measured by and through language. The inability to handle one or more of the skills of language is one probable reason for failure in school. Most teachers indicate that lack of ability in verbal expression is the most serious disadvantage their students can have in the classroom.[3] Bordie cites the Illinois Test of Psycholinguistic Ability as an example of a current oral test.[1] Some Head Start Programs are currently using this instrument for evaluating oral language proficiency. It appears, however, that only on the basis of a few items is verbal ability assessed.

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[1] John G. Bordie, "Language Tests and Linguistically Different Learners: The Sad State of the Art," Elementary English, October, 1970, p. 816.

[2] Bordie, p. 817.

[3] Bordie, p. 820.

The MLA Cooperative Foreign Language Test assesses all four language skills: listening, speaking, reading, and writing. The standard used for assessing oral competency is a tape included with the test kit, on which is recorded the voice of a student who has taken the test before. The student's speech has been determined by the MLA Cooperative Foreign Language Test makers to be a sample of speech used by the "average" American student taking a second year in a foreign language at the high school, or a one year course at the college level.

The test is administered in a language laboratory having individual student recording facilities. The students use test booklets as they listen to a master tape through headphones. In one instance, the booklet shows a series of cartoon-like pictures in sequence but without any words. The student is told to study the pictures for one minute and, at a given signal, is told to relate orally the sequence that he sees in his booklet. As he speaks, a recording is made of his voice for the purpose of analysis.

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[1] Bordie, p. 820.

When the teacher hears the tape which is included in the test kit, she gets an idea of a standard to use by which to evaluate her pupils' performance. At evaluation time, she is also following a script in her booklet, so as to pay particular attention to specific words and/or sounds that must appear in the student's oral rendition.

Bordie speaks about tests for oral language assessment as being generally weak because there is lacking a generally accepted standard of language use to which instructional techniques may relate or which can serve as an effective model.[1] This test is perhaps an exception.

The Gloria and David Oral Bilingual Test consists of a filmstrip of 20 frames of drawings of two children, Gloria and David, engaged in sequentially developed activities which include: taking a bath and getting ready for bed; getting up and brushing their teeth and their hair; putting clothes and shoes on; playing with the baby; eating breakfast and finally going off to school.

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[1] Bordie, p. 815.

The voice which the child being assessed hears is that of a Texas-born bilingual woman speaking English and Spanish without accent. She begins by saying a sentence about the frame being shown, in English first and then in Spanish. The filmstrip is shown on the screen of a machine called the Teaching Assistant. The sentences in English precede the ones in Spanish after each of the frames. Between each sentence there is a pause, during which time the child repeats each utterance. As he does, a recording is made of his voice for the purpose of analysis.

The oral assessment consists of repeating 25 sentences in English and 25 in Spanish. The English sentences contain 21 consonants in at least one position; /j/ as in "judge" and /z/ as in "vision" are not included. All the vowels appear at least one time each, as do two diphthongs, /ey/ and /iy/ in the words they and he respectively.

The Spanish phonological content consists of the vowels /a,e,o/, which occur in stressed and in unstressed positions. /i/ and /u/ occur in stressed position only. The diphthongs /je/, /ja/, and /aw/ are also included, as are all the consonants of Spanish.

The equipment used consists of a television-like machine, the Teaching Assistant, to which is connected a combination head set and boom-type microphone for the child's use. The machine has a television-size screen of approximately 18 inches diagonal width. The tape, which contains the model's voice, the electronic impulses which advance each frame on the filmstrip, and the tape on which the child's voice is to be recorded, resembles an 8-track tape. The tape is attached to a plastic case which also contains the 16mm single loop filmstrip. The filmstrip and tape are synchronized so that they start at the touch of a button and also automatically turn off after the session, which takes about eight minutes.

In summary, the overall impression of assessment instruments in current use seems to be that: (1) they tend to require using a form of standard English; (2) they tend to be geared towards the middle-class student; and (3) they tend to favor cognitive learning over rote learning by asking question for recall of information rather than repetition of standard speech patterns. It appears that the speaker of nonstandard English and the pupil learning English as a second language are at a disadvantage because their training in standard English probably involves using associative learning techniques.

Many linguists and language researchers have argued that the difference between the linguistically sophisticated and the linguistically immature is not so much the awareness of correct and incorrect usage but rather the general knowledge of a wide range of language varieties and adequate contact with the varieties most characteristic of school instruction. Bordie mentions experiments showing that it is better to expand the student's language repertory than it is to correct the language he uses in his daily life. By providing a wide range of experiential contacts, the teacher and the curriculum can make clear that language consists of a variety of styles which must be mastered, each of which has its own value and use.[1]

The traditional school curriculum seems to assume that every child in school has a minimum mastery of English, and that he can understand and speak at will about anything within the limits of his experiences. Unfortunately this assumption may not be valid for the Mexican-American youngster whose home language happens to be a dialect of Spanish and a dialect of English.

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[1] Bordie, p. 823.

Spelling

One of the difficulties in spelling in American-English lies in the fact that words of non-Anglo-Saxon origin appear to constitute a majority of the whole English lexicon, according to Horn, who adds:

> many words of Anglo-Saxon origin were respelled as a result of the degradation on the language following the Norman Conquest in 1066. In addition, we have anglicized pronunciation of borrowed words without making a corresponding spelling change. Changes in inflections and the persistence of regional dialects have also made spelling a problem.[1]

The traditional method of teaching spelling relies upon visual and hand learning approaches. Perhaps more can be involved in the spelling act than to learn each word in a separate learning act. One of the ways that spelling may be improved is through the use of linguistic principles. Hodges states that the orthography of American-English is determined by a set of rules for unit phoneme-grapheme relationships, based, with decreasing productivity, upon three levels of analysis: phonological, morphological, and syntactical. The phonological level is divisible into position, stress, and environmental factors.[1]

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[1] Thomas D. Horn, "Spelling," in Encyclopedia of Educational Research. New York: The Macmillan Company, 1969.

A traditional spelling lesson entails learning 15 or 20 words each week, classified, according to Hanna, like this:

1. Words grouped at random, e.g., tree, fine, sick;
2. Words grouped according to visual similarities, e.g., nation, function, invitation;
3. Words grouped into meaningful association around a typical child interest, e.g., playing with dolls, or a curricular topic such as Colonial Life;
4. Words grouped in phonemic families, e.g., long a sound as in make, made and having a final silent e.[2]

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[1] Richard E. Hodges and E. Hugh Rudorf, "Searching Linguistics for Cues for the Teaching of Spelling," Elementary English, May, 1965, p. 531.

[2] Paul R. Hanna, et al. Phoneme-Grapheme Correspondences as Cues to Spelling Improvement. Washington, D.C.: U.S. Department of Health, Education, and Welfare, Office of Education, 1966, pp. 12-13.

In teaching spelling, Venezky suggests using units made up of one or more letters called spelling units. Consonant units may be made up of single consonants or of combinations which function as single units, e.g., gh, sh, th, and wh. Thus a rule such as "A long vowel sound can be spelled by a single letter vowel, followed by a single consonant letter, and then a silent e," would not be fraught with such exceptions as axe, bathe, and writhe. By substituting a single consonant unit for the phrase a single consonant letter in the rule stated, the rule would have more validity.[1] Brengelman states that it is possible for the same spelling system to be entirely adequate for dialects which may sound conspiciously different.[2]

One of the objections to the Hanna study questions the teaching of an ideal pronounciation when in fact spelling, based on oral manifestations internalized in the pupil, may not be pronounced the same in all the

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[1] Richard L. Venezky, "Linguistics and Spelling," in Linguistics in School Programs, 66th Yearbook of the National Society for the Study of Education. Chicago: The University of Chicago Press, 1970, p. 268.

[2] Frederick H. Brengelman, "Dialect and the Teaching of Spelling," Research in the Teaching of English. Fall, 1970, pp. 129-138.

American dialects. Even though approximately 50 percent of the words were correctly spelled according to the algorithm, the algorithm used as the standard pronunciation was Meriam-Webster's New International Dictionary, Second Edition, said to represent Mid-western American, middle class pronunciation. A dictionary is a poor thing to rely on for pronunciation, according to Roberts.[1] The dictionary in question, he says, often indicated, in unstressed positions, "vowels which in American speech are heard only in stressed positions." The occurrences of schwa and /i/ in the dictionary is much lower than in actual speech; it also merges the a of account with the a in add, rather than with the a in abound.

Venezky favors using the sound of words or phonemes for the teaching of spelling. He speaks of the Bloomfieldian sequencing in teaching spelling which entails introducing words having the /æ/ sound such as is found in rat, mat, fat, hat, and man. He calls this approach the simple sequencing method and, in contrast, suggests using the differentiation approach:

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[1] A. Hood Roberts, "A Review by a Specialist in the Uses of Computers in Linguistic Research," Roundtable Review, Research in the Teaching of English. NCTC, 1 (Fall, 1967), 204.

rat : rate
mat : mate
fat : fate
hat : hate
man : mane

Venezky states that, whereas the Bloomfieldian sequencing begins with the /æ/ pronunciation for a, introducing the /e/ pronunciation at a later time with no special emphasis on the relation between /æ / and /e/ when derived from a, the differentiation approach suggested by him presents both pronunciations at once.[1]

In an article by Rudorf, Paul Goodman is quoted as equating phonological deviances from standard spelling as being the same as learning a second language.[2] After studying the language of ghetto children, Baratz (as quoted by Wolfram) concludes that we are dealing with different but equal systems of language.[3] The most prominent role that stress plays in spelling-to-sound correspondences is in the pronunciation of unstressed vowels, according to Venezky who adds that even though the reduction of unstressed vowels to schwa is not entirely regular, it can still be predicted in many cases.[1] Speaking about the Hanna study, Roberts stated a quote from the report which said that the difference between primary and secondary stress was not useful in determining graphemic options for any given phoneme.[2]

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[1] Richard Venezky, "Spelling-to-Sound Correspondence," Reading Research Quarterly. Spring, 1967, p. 82.

[2] E. Hugh Rudorf "An Investigation of First-Grade Spelling Achievement," Elementary English. February, 1970, pp. 238-246.

[3] Joan C. Baratz as quoted by Walter A. Wolfram, "The Nature of Nonstandard Dialect Divergence," Elementary English. May, 1970, pp. 151-160.

Hodges speaks about internal constraints or environmental factors that affect spelling:

> while the spelling of the phoneme /f/ can be predicted only 74 percent of the time on the basis of positional effect of a phoneme in a syllable, the simple phoneme-grapheme relationships and the effect of syllabic stress upon choice of spelling option, environmental factors also apply: when /f/ follows /s/, it is always spelled "ph" instead of "f," as in sphere, sphinx. Thus environment limits the choice of spelling.[3]

American-English spelling is alphabetical, and the Stanford study shows to what degree it is consistent. Accurate measurements of the effects of the Mexican-American dialect patterns upon spelling may indicate to what degree and in what way a spelling program would reflect the social and geographical backgrounds being studied.

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[1] Venezky, "Spelling-to-Sound Correspondence," p. 83.

[2] Hodges and Rudorf, 530.

[3] Roberts, p. 207.

Venezky speaks about the spelling-sound-patterns based upon phonological habits:

> Spelling Choice
>
> The choice between /s/ and /k/ for c is primarily dependent upon spelling; /s/ when c is followed by front vowel spellings, e, i, or y and /k/ otherwise.
>
> Phonological Choice
>
> The choice between /n/ and /ŋ/ for n is primarily phonological, in that /ŋ/ occurs only when a velar stop follows. /n/ generally does not occur before /g/ or /k/; where it would be, it is backed to an /ŋ/. (In contrast, both /s/ and /k/ occur before front vowels, e.g. kit:city, cat:sat).[1]

A native speaker of English can perform the above change automatically, however, the Mexican-American child does not have his speech upon which to rely in making such changes, if his home language is Spanish. Although the lack of oral competency in English may not preclude the use of such generalizations, it would appear to be helpful to the child to use oral speech as a basis for writing. Brengelman states that differences in inventory and distribution of phonemes need not cause spelling difficulties, if a phoneme of one dialect occurs predictably in the same position in the same words as a different phoneme in another dialect.[1] Graham and Rudorf discuss the relationship found between misspellings and dialect:

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[1] Venezky, "Spelling-to-Sound Correspondence," p. 82.

> While not stated as a specific hypothesis in this study, the tentatively established relationship between dialect and misspellings may well be interpreted as evidence that a significant part of a child's spelling performance is based upon phonological cues. When errors in spelling are seen to correlate with known dialect divergence, the child must be utilizing phonological cues for correspondences, since the visual representations would be the same for all.[2]

Horn speaks about the studies done among children whose first dialect differs markedly from the one used in school which show that faulty speech habits, particularly in pronunciation, were found among poor spellers.[3] Brengelman explains how the permitted sound feature sequences differ from dialect to dialect:

> Thus for many Americans the spellings "wh" and "w" reflect a phonological difference: for such speakers

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[1] Brengelman, p. 133.

[2] Richard T. Graham and E. Hugh Rudorf, "Dialect and Spelling," Elementary English. March, 1970, p. 372.

[3] Horn, p. 1287a.

> the words where and wear, when and wen, what and watt, . . . are not homophones. For almost all the speakers of British English, the spellings "wh" and "w" are entirely arbitrary. Differences in pronunciation among English dialects may reflect differences in their underlying phonological system.[1]

Materials for spelling which have a phonological basis in one dialect may be found in conflict in another dialect having a different pronunciation for the same grapheme. That spelling is not representation of surface features is declared by Brengelman, who adds that spelling is morphemes symbolized by characters representing their abstract or underlying phonological structure. If spelling is morphemes representing phonemes, the problem of allowing for dialect differences in preparing spelling materials will be better understood, for although spelling is not phonetic, there seems to be a connection between our choice of letters and the phonological representation of morphemes.[2]

Spelling is essentially a special problem in reading, says Hanna, "wherein the child must learn to pronounce the letters of written words and remember which letters made the sounds of these words."[1] Horn speaks of the ultimate goal in spelling as being to enable students to spell correctly the words needed both in and outside school, now as students and later as adults.[1] Rudorf defines spelling ability as the ability to spell those specific words needed for written communication.[2] Hodges compares the spoken language and spelling, saying that while the former requires only that its users be adept in oral and aural skills, the latter necessitates that its users be facile with aural-oral skills and with visual skills as well.[3]

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[1] Brengelman, p. 134.

[2] Brengelman, p. 135.

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[1] Horn, p. 1283.

[2] E. Hugh Rudorf, "Measurement of Spelling Ability," Elementary English. December, 1965, p. 889.

[3] Hodges, p. 630.

CHAPTER III

METHODS AND PROCEDURES

This investigator designed this study to find the relationship that may exist between the way a child speaks and the way he spells. An additional task of this investigation was to determine the relationships that the variables of age, sex, home language and sibling placement (order) among his brothers and sisters may have on speech. Also of interest would be the influence of the type of instruction at the second grade level, bilingual instruction or instruction in English only, and the relationship it has to speech and to spelling.

Description of Subjects

The subjects for this study were sixty-seven Mexican-American second grade pupils attending urban schools in San Antonio and Corpus Christi, Texas. The two Texas urban areas are situated approximately one hundred fifty miles apart. Each school setting from which the investigator chose the subjects is located within an area generally referred to as the inner-city. It is usually located close to the central business district. For the most part, the people living in the neighborhood are Mexican-American, they pay rent, and live either in modest houses or in federal housing projects.

As a part of The University of Texas at Austin Teacher Corps Project during the 1970-71 school year, the University completed an oral language assessment of over 700 linguistically different learners in San Antonio, Texas. Using a table of random numbers, this investigator selected a total of 45 subjects representing all the second grade classes in two schools--seven classes in all--from the San Antonio Project for the study.[1] Because the San Antonio sample did not represent bilingual instruction in English and in Spanish, this investigator also selected an additional 24 subjects in four second grade classes in Corpus Christi, from approximately 100 youngsters whose curriculum included both English and Spanish as mediums of instruction. Inferior phonological assessments reduced the number to 22 subjects.

The Corpus Christi Independent School District started Follow Through classes in 1967. This program is one of the original Follow Through programs in the nation; 30 programs started in that year, and the program in Corpus Christi started with four classes. The schools participating, Zavala, Lamar, and Lozano, have an enrollment of approximately 99 percent Mexican-American. All pupils who meet the poverty guidelines of the Office of Economic Opportunity receive medical, dental, nutritional, and other ancillary services.

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[1] Downie, p. 328.

In Corpus Christi, the investigator used the Gloria and David bilingual materials for the phonological assessment, except without the use of the Teaching Assistant machine. The Corpus Christi Public Schools own a set of the Gloria and David Bilingual Oral Language Test, 1958 edition. The oral material is recorded on records and the filmstrip has subtitles in English under each frame. Language Arts Incorporated gave permission to make a tape recording of the material on records for this assessment.

The filmstrip with English subtitles was the first problem solved. By using a felt-tipped pen with washable purple ink, the investigator completely covered the sentences in each frame, without harming the filmstrip and without distracting in any way from the picture. The sentences on records are essentially the same sentences used in the newer edition materials, and the speaker is the same person using exactly the same intonation. Two of the sentences used in Corpus Christi, "Gloria y David beben la leche," and "Los niños están de rodillas," are slightly different from the San Antonio sentences: "Gloria y David beben leche," and "Están de rodillas." The three words appeared in the spelling test.

Treatments

The instructional component of Follow Through involves bilingual instruction. Reading is taught in Spanish as well as in English. Approximately one hour daily is devoted to teaching reading in Spanish; a longer period each day is devoted to teaching reading in English. Each classroom has a teacher aide who helps by working with small groups. For the most part, reading materials for Spanish are teacher-made and include such things as flash cards and vocabulary cards and reading experience charts. Commercial reading materials in Spanish include books printed in Mexico and Puerto Rico. Readiness books have also been written by consultants in the system for Follow Through. In addition, and to save time, teachers make use of Spanish to teach in the other subjects.

A recently completed evaluation of the 1970-71 program shows that pupils in grade two did markedly better in all areas than the control groups. Achievement as measured by instruments in Spanish show that grade two pupils did better in Spanish than in English, and the Spanish score was significantly higher than that of the control group.[1]

All of the children participating in this study received spelling instruction every week. The time varied from 25 to 30 minutes daily. All the classrooms participating used the same textbook for spelling.[2]

Table 1 shows the number of classrooms sampled. Sixty-seven second graders in eleven classrooms located in Corpus Christi and in San Antonio, Texas, were tested The biggest sample used was in San Antonio. Table 2 shows Storm School as the school from which forty-seven percent of the pupils were tested for this study.

The largest age-group was the eight-year-olds. Over sixty-eight percent of the children in second grade were in this age group. Table 3 shows this information.

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[1] Mary Alice David, "School District Evaluates Follow-Through Program," The Corpus Christi Times, January 11, 1972, p. B-1.

[2] William Kottmeyer and Audrey Claus, Basic Goals in Spelling, New York, McGraw-Hill Book Company, 1968.

TABLE 1

NUMBER OF CLASSROOMS AND SAMPLE SIZE

	Grade	Classrooms	Sample Size
San Antonio	2	7	45
Corpus Christi	2	4	22
Totals		11	67

TABLE 2

CLASSROOMS AND SAMPLE SIZE FROM SECOND GRADES IN TWO SAN ANTONIO SCHOOLS AND THREE CORPUS CHRISTI, TEXAS, SCHOOLS TEACHING MEXICAN-AMERICANS, 1971

School	Number of Classes	Sample Size
Storm School (San Antonio)	5	32
Brewer School (San Antonio)	2	13
Lamar School (Corpus Christi)	1	5
Lozano School (Corpus Christi)	1	6
Zavala School (Corpus Christi)	2	11
Total	11	67

TABLE 3

COMPARISON OF 67 STUDENTS' AGES IN THE SAMPLES BY SCHOOLS, SAN ANTONIO AND CORPUS CHRISTI, TEXAS, 1971

Ages	Storm School San Antonio	Brewer School San Antonio	Lamar School Corpus Christi	Lozano School Corpus Christi	Zavala School Corpus Christi	Total
7		9	2	1	1	13
8	12	18	2	5	9	46
9		5	1		1	7
10		1				1
Total	12	33	5	5	11	67

The number of siblings in both samples is found in Table 4. Every youngster tested had at least one sibling at home, and ten of them in both samples had nine or more siblings at home. Fifty percent of the youngsters in each sample, at least, had from three to seven siblings at home.

Table 5 shows the sibling placement of the youngsters. Almost half of the youngsters were in first, second, or third in their families in sibling placement; one in each sample was the "baby" in a family.

Within-group comparisons by sex were made of the two samples. Table 6 shows an almost even distribution as to sex in the Corpus Christi sample. In the San Antonio sample there were more boys than girls.

Instrumentation

This study attempted to determine what kind of phonological differences in Spanish and in English are manifested in the oral language of Mexican-American children at the second grade level. It was expected that this study would yield information as to what patterns of influence, if any, there are from oral Spanish to oral English and vice versa, and how these patterns affect spelling deviations for the group as a whole.

TABLE 4

NUMBER AND PERCENTAGE OF SIBLINGS OF 22 CORPUS CHRISTI, AND 45 SAN ANTONIO, TEXAS, MEXICAN-AMERICAN CHILDREN, 1971

Number of Siblings	Number of Students		Percentage	
	Corpus Christi	San Antonio	Corpus Christi	San Antonio
0	0	0	0	0
1	1	0	4	0
2	4	6	18	13
3	0	5	0	11
4	7	5	30	11
5	3	7	14	16
6	2	8	9	18
7	1	4	4	9
8	1	3	4	7
9 and over	3	7	14	16
Total	22	45	97	100

TABLE 5

NUMBER AND PERCENTAGE OF SIBLING PLACEMENT (ORDER) OF
22 CORPUS CHRISTI AND 45 SAN ANTONIO, TEXAS
MEXICAN-AMERICAN SECOND GRADERS, 1971

Sibling Placement (Order)	Number of Students		Percentage	
	Corpus Christi	San Antonio	Corpus Christi	San Antonio
1st	5	4	22	9
2nd	5	9	22	20
3rd	4	8	17	18
4th	0	9	0	20
5th	3	6	14	13
6th	3	5	14	11
7th	1	3	4	7
8th	1	1	4	2
Total	22	45	99	100

TABLE 6

COMPOSITION OF THE GROUP BY SEX, FOR A GROUP OF 23 CORPUS CHRISTI AND 46 SAN ANTONIO, TEXAS, PUPILS, 1971

	Number in Sample	Percentage
Corpus Christi		
Males	12	54
Females	10	46
San Antonio		
Males	28	62
Females	17	38

In order to gather a corpus of words to be used in a spelling test to see what relationships, if any, exist between speaking and spelling, the children's oral competency in both languages had to be assessed. The instrument used for this purpose was the Gloria and David Oral Bilingual Test-Spanish and English.[1] Natalicio completed an evaluation of the test to assess the degree to which sentence repetition by Black and Mexican-American children (grades K-2) could be used as a basis for language evaluation. She states that the results indicated high reliability of scale judgments, although not in all areas and not in reading.[2]

The assessment instrument is made up of twenty pictures on a filmstrip coordinated with 50 sentences about the pictures, 25 in Spanish and 25 in English. The instrument used on which to test each child, the Teaching Assistant, consists of a television-type machine on which the filmstrip is shown, having a jacket for headphone and microphone headset combination. The child sits in front of the receiver, puts on the headphones and adjusts the volume. As each frame appears on the screen a sentence in Spanish, followed by one in English, is heard by the child describing the picture. The voice on the tape is that of a Texas-born woman speaking dialectically "unmarked" Spanish and English. After each sentence there is a pause so that the child may repeat the utterance. As he does, a recording is made of his voice for the purpose of analysis.

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[1] Devine, op. cit.

[2] Diana S. Natalicio and Frederick Williams. Repetition as an Oral Language Assessment Technique. The University of Texas at Austin: Center for Communication Research, 1971, p. 1.

The automatic control of time and synchronization yields a great advantage in the use of these materials: it avoids any administrative variation from one subject to the next and provides a desired objectivity. The test time requires just under ten minutes. Consequently, an excessive attention span is not imposed on a second-grade child.

Using the voice on the tape as a standard, a corpus of words was gathered that showed pronunciation as different 10 percent or more of the time by the entire group. The phonological assessment of the San Antonio sample was done at the beginning of the school year, 1970-71. The first analysis done from the assessment was completed in March, 1971, and on the basis of that analysis a corpus of words was obtained to use in the spelling test.

To minimize the variability of administering the spelling test and to control the administration variable, it was decided that a tape be made containing the words to be spelled. It was further decided that the voice dictating the spelling words be the same voice used during the phonological assessment. With the cooperation of Language Arts, Incorporated, a spelling tape was made from the Gloria and David instructional materials following this sequence: (1) each word to be spelled was first heard in isolation; (2) the word was then heard used within the same sentence that the child repeated during the phonological assessment; (3) the word was heard in isolation one more time prior to the students' writing it down. The investigator stopped the tape after the word was heard the second time, allowing the students ample time for writing, usually ten seconds per syllable. The investigator also called out the number of the word coming up next. It took under fifteen minutes to administer the spelling test.

When the instrument was first pilot-tested, teachers felt that four words: breakfast, toothbrush, desayuno (breakfast) and despiertan (they awaken) should not be used. The children had not had them in their written vocabulary and the teachers considered them too lengthy for the children to spell.

The investigator administered the revised test to the San Antonio sample on May 11, 1971. Whereas the phonological assessment was done on an individual basis, groups of from six to ten children together took the spelling test. The investigator used the same receiver, the Teaching Assistant, minus the filmstrip to play the tape containing the words for the spelling test. The test tape did not say the number of each word in the spelling test; this information was provided by the investigator. The investigator stopped the tape momentarily before each next word for the purpose of saying the number of the word coming up next.

The investigator allowed a minimum of ten seconds per syllable as spelling time for each word. This time limit was not built into the test tape; the investigator used a watch with a second hand to determine when to say the number of the word coming up next.

For the Corpus Christi sample, the investigator made a tape recording of the material on records. The tape was then recorded on one channel of an Eico stereo cassette recorder. This recorder has the feature of recording a beep impulse on the other stereo channel; this inaudible impulse allows the filmstrip to advance to the next frame automatically. Because the tape and the filmstrip were thus synchronized, there was no need for a monitor once the assessment got under way.

The equipment for showing the filmstrip was a Dukane viewer with a turntable on top. The turntable was not used because the oral sentences were being received through headphones that the child used during the recording session. Another cassette, with a microphone held by the child, was making a recording of his voice.

Language Arts, Incorporated, Austin, Texas, scored the tapes containing the Corpus Christi phonological assessment. The same graduate student who did the phonological analysis of the San Antonio sample also did the phonological analysis of the sample from Corpus Christi. The investigator further analyzed the tapes for vowel phoneme/grapheme relatedness.

The data used in this study covers the period from November, 1970 to June, 1971, a period of seven months. However, additional data on vowels was gathered in June, 1972. See Appendix G. Table 7 shows the date of the beginning of the phonological assessment in

TABLE 7

CHRONOLOGICAL TABLE SHOWING THE DATES OF THE PHONOLOGICAL ASSESSMENTS AND OF THE SPELLING TESTS, CORPUS CHRISTI AND SAN ANTONIO, TEXAS, 1971

November, 1970	Phonological assessment completed for San Antonio schools
March, 1971	Analysis of San Antonio phonological assessment completed
April, 1971	Taped spelling test completed and pilot tested in Corpus Christi
May 11, 1971	Spelling test administered to pupils in San Antonio
May 17, 1971	Phonological assessment begun in Corpus Christi
May 21, 1971	Phonological assessment completed in Corpus Christi
May 24, 1971	Spelling Test administered in Corpus Christi
June, 1971	Analysis of phonological assessment for Corpus Christi sample completed
August, 1971	Data analysis for Corpus Christi and San Antonio begun
January, 1972	Data analysis for both samples completed
July 24, 1972	Spelling Test for additional vowel study administered in Corpus Christi
August 24, 1972	Data analysis for additional vowel study completed

San Antonio as the first step. Language Arts, Incorporated, Austin, Texas, completed the phonological assessment for San Antonio in November, 1970. This investigator, however, completed the phonological assessment of the Corpus Christi sample in May, 1971, except as mentioned above for vowels. Both samples took the spelling test in May, 1971.

Table 8 shows the words in English that the investigator selected for phoneme/grapheme score comparisons. The final phoneme in twelve of the fifteen words was studied for phoneme/grapheme score comparisons. Two of the words had the initial sounds studied.

Table 9 shows the words in Spanish selected for phoneme/grapheme score comparisons. Five of the fifteen comparisons dealt with the final phoneme/grapheme. The vowels in English were not selected for score comparison because of the variety of graphemes used in spelling the same vowel sound. Generally speaking, a consonant phoneme was represented in the spelling test by only one grapheme. Spanish vowels were studied because they generally do not present a problem in spelling as do the vowels in English. Both the words in English and the words in Spanish had the final _s_ studied for phoneme/grapheme score relatedness. The results of the comparisons were different for each language.

TABLE 8

ENGLISH WORDS SELECTED FOR ANALYSIS, 1971

washes	cleans	they
has	brush	she
teeth	wash	children
goes	with	David
bed	David's	hands

TABLE 9

SPANISH WORDS SELECTED FOR ANALYSIS, 1971

el	la	los
ellos	beben	niños
le	está	va
dientes	ayuda	pierna
están	vestir	baña

Preparing the Spanish Spelling Tape

Preparing the Spanish part of the spelling tape was a bit of a problem. The taped utterance is such that the spelling word is given, then it is used in a sentence, and then given once more before the children write it down. The English part of the tape was simply copied from the record to the tape. Since in the English oral exercise each word is said in isolation so that the child may hear each word, it was not difficult to pick out the isolated word and transcribe it before and after the sentence sample. Spanish words, however, were not pronounced in isolation in any of the recorded materials. The Spanish sentences introducing each frame were pronounced at a normal rate of speech. To make the Spanish test tape, the investigator had to record the word before and after the sentence transcribed for each sentence on the taped test. The technical difficulty was in dubbing onto the tape the word to be spelled before and after the sample sentence and also at the exact volume as the volume being transcribed from the record. The result was a tape having two volumes: the volume from the sentences coming from the record, and the volume of the words being inserted before and after each Spanish sentence. By re-recording the finished tape on a recorder having an automatic volume control, volumes of the different voices were equalized.

The phonological assessment of the Corpus Christi sample started on May 24, 1971. The assessment involved testing pupils in three different schools. The investigator tested each child individually, usually in the library or in another setting besides the classroom. The child was told that a recording of his voice was going to be made. The investigator handed the child a small microphone, showed the child how to hold the microphone close to his mouth and asked him to speak his name into the microphone. The investigator and the child rapidly evaluated the recording of the child'a name both for volume and clarity. The child would sit comfortably before the receiver, adjust the headphones and hold the microphone close for recording. The investigator placed the equipment in a start position, and from then on everything was automatic.

The investigator administered the spelling test during the week of May 24, 1971. All pupils in each class took the spelling test, although the papers evaluated were the ones corresponding to the children involved in the phonological study.

The spelling test administered to the Corpus Christi sample was the same test used with the San Antonio sample. But, whereas the San Antonio sample took only a test in English, the Corpus Christi sample took tests in both English and Spanish.

A Composite Breakdown of the Words Showing Pronunciation Deviances as They Appear in the English and in the Spanish Sentences of the Gloria and David Bilingual Oral Test

The sentences which begin on the following page are those the children repeated during the phonological assessment. Each sentence first appears the way it was said by the model. For the purpose of tabulation, each sentence is further broken down into its component words, and each word appears numerically listed under the sentence in outline form. This facilitates describing the word wherein there occurred a phonological deviancy. Only the word which has a part underlined has been described as to rendition, and some of the percentages show deviations of less than 10 percent of the time.

Num-ber	Sentence	Rendition by Model	Rendition by Pupil	Num-ber	% of total
1.0	Mother washes David's neck.				
1.1	Mother	[illegible]	[illegible]	6	8.9
1.2	washes	[illegible]	[illegible]	[illegible]	[illegible]
	washes	[illegible]	[illegible]	[illegible]	[illegible]
	washes	[illegible]	[illegible]	[illegible]	[illegible]
1.3	David's	[illegible]	[illegible]	[illegible]	[illegible]
	David's	[illegible]	[illegible]	[illegible]	[illegible]
1.4	neck	[illegible]	[illegible]	[illegible]	[illegible]
2.0	She washes his ears.				
2.1	She	[illegible]	[illegible]	29	43.3
2.2	washes	[illegible]	[illegible]	19	28.3
	washes	[illegible]	[illegible]	16	23.9
2.3	his	[illegible]	[illegible]	20	29.9
2.4	ears	[illegible]	[illegible]	24	35.8
3.0	Gloria washes her hair.				
3.1	Gloria	[illegible]	[illegible]	8	11.9
3.2	washes	[illegible]	[illegible]	40	59.7
	washes	[illegible]	[illegible]	35	52.2
	washes	[illegible]	[illegible]	6	8.9
3.3	her				
3.4	hair				
4.0	Gloria cries.				
4.1	Gloria	[illegible]	[illegible]	4	5.9
4.2	cries	[illegible]	[illegible]	10	14.9
5.0	Soap is on her nose.				
5.1	Soap	[illegible]	[illegible]	[illegible]	[illegible]
5.2	is	[illegible]	[illegible]	[illegible]	[illegible]
	is	[illegible]	[illegible]	[illegible]	[illegible]
5.3	on*	[illegible]	[illegible]	[illegible]	[illegible]
5.4	her				
5.5	nose	[illegible]	[illegible]	[illegible]	[illegible]

---

*Among the phonologic [illegible] than a phonological nature [illegible] drinks, for example.

Number	Sentence	Rendition by Model	Rendition by Pupil	Number	% of total
6.0	Mother helps Gloria.				
6.1	Mother	/ð/	/d/	8	11.9
6.2	helps	/[illegible]/	/[illegible]/	19	28.3
6.3	Gloria	/[illegible]/	/[illegible]/	[illegible]	[illegible]
7.0	David has a toothbrush.				
7.1	David	[illegible]	[illegible]	[illegible]	[illegible]
	David	[illegible]	[illegible]	[illegible]	[illegible]
	David	[illegible]	[illegible]	[illegible]	[illegible]
7.2	has	[illegible]	[illegible]	24	35.8
7.3	a				
7.4	toothbrush	/θ/	/s/	32	47.7
	toothbrush	/ʃ/	/s/	17	25.3
8.0	He cleans his teeth with his brush.				
8.1	He*	/h/	/[illegible]/*	5	7.4
8.2	cleans	/z/	/s/	35	52.2
	cleans	/iy/	/i/	3	4.4
8.2	his	/z/	/s/	5	7.4
	his	/i/	/iy/	7	10.4
8.4	teeth	/θ/	/s/	14	20.8
8.5	with	/θ/	/s/	18	26.8
8.6	his	/z/	/s/	5	7.4
8.7	brush	/ʃ/	/s/	23	34.3
9.0	They are on their knees.				
9.1	They	/ð/	/d/	37	55.2
	They	/ey/	/e/	1	1.4
9.2	are				
9.3	on	[illegible]	[illegible]	[illegible]	[illegible]
9.4	their	[illegible]	[illegible]	[illegible]	[illegible]
9.5	knees	[illegible]	[illegible]	[illegible]	[illegible]
	knees	[illegible]	[illegible]	[illegible]	[illegible]

*[illegible]

Number	Sentence	Rendition by Model	Rendition by Pupil	Number	% of total
10.0	The children go to bed.				
10.1	The	/ð/	/d/	29	43.2
10.2	children	/tʃ/	/ʃ/	39	58.2
	children	/ɪ/	/i/	20	29.8
	children	[illegible]	[illegible]	11	16.4
	children	[illegible]	[illegible]	1	1.5
10.3	go	[illegible]	[illegible]	1	[illegible]
10.4	to				
10.5	bed	[illegible]	[illegible]	20	[illegible]
11.0	The light is not on.				
11.1	The	/ð/	/d/	26	38.8
11.2	light				
11.3	is	/z/	/s/	16	23.8
11.4	not				
11.5	on				
12.0	Mother wakes Gloria and David.				
12.1	Mother	/ð/	/d/	7	10.4
12.2	wakes	/s/	/∅/	12	17.9
12.3	Gloria	/r/	/rr/*	7	10.4
12.4	and				
12.5	David	/d/	/t/	17	25.3
	David	/ɪ/	/iy/	2	2.9
	David	/v/	/b/	13	19.4
13.0	Gloria and David both get clean clothes.				
13.1	Gloria	/r/	/rr/*	[illegible]	[illegible]
13.2	and				
13.3	David	[illegible]	[illegible]	[illegible]	[illegible]
	David	[illegible]	[illegible]	[illegible]	[illegible]
	David	[illegible]	[illegible]	[illegible]	[illegible]
13.4	both	[illegible]	[illegible]	[illegible]	[illegible]
	both	[illegible]	[illegible]	[illegible]	[illegible]
13.5	get				
13.6	clean				
13.7	clothes	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

Num- ber	Sentence	Rendition by		Num- ber	% of total
		Model	Pupil		
14.0	Gloria cannot button her dress.				
14.1	Gloria				
14.2	cannot				
14.3	button				
	button	/t/	/Ø/	[illegible]	[illegible]
14.4	her		[illegible]	[illegible]	[illegible]
14.5	dress	[illegible]	[illegible]	[illegible]	[illegible]
15.0	The socks are on Gloria's feet.				
15.1	The	/ð/	/d/	33	49.2
15.2	socks	/s/	/Ø/	25	[illegible]
15.3	are	/r/	/Ø/	5	7.4
15.4	on	/a/	/ɪ/*	24	35.8
	on	/a/	/ɔ/	4	5.9
15.5	Gloria's	/z/	/Ø/	20	29.8
15.6	feet	/ /	/-s/	12	17.9
	feet	/iy/	/ɪ/	1	1.4
16.0	Baby has a sock on his leg.				
16.1	Baby				
16.2	has	/z/	/s/	9	13.4
	has	/z/	/Ø/*	20	29.8
16.3	a				
16.4	sock				
16.5	on	/a/	/ɪ/*	9	13.4
16.6	his	/z/	/s/	7	10.4
	his	/ɪ/	/iy/	7	10.4
16.7	leg	/ɛ/	/æ/	[illegible]	[illegible]
	leg	/ɛ/	/ey/	[illegible]	[illegible]
17.0	[illegible]				
17.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
17.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
17.3	[illegible]				
17.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Number	Sentence	Rendition by		Number	% of total
		Model	Pupil		
	17.5 for				
	17.6 his	/z/	/s/	12	17.9
	his	/i/	/iy/	15	22.3
	17.7 hair				
18.0	The family eats breakfast.				
	18.1 The	/ð/	/d/	23	34.3
	the	/ə/	/i/	4	5.9
	18.2 family	/ə/	/i/	3	4.4
	18.3 eats*	/s/	/∅/	9	13.4
	eats	/iy/	/i/	6	8.9
	18.4 breakfast	/t/	/∅/	24	35.8
	breakfast	/ə/	/e/	1	1.4
19.0	Gloria and David drink milk.				
	19.1 Gloria	/iy/	/∅/	4	5.9
	19.2 and	/æ/	/∅/	4	5.9
	19.3 David	/d/	/t/	9	13.4
	David	/i/	/iy/	4	5.9
	David	/v/	/b/	4	4.9
	19.4 drink_*	/ /	/-s/	7	10.4
	drink	/i/	/iy/	20	29.8
	19.5 milk				
20.0	The children wash their hands.				
	20.1 The	/ð/	/d/	19	28.3
	the	/ /	/iy/	12	17.9
	20.2 children	/č/	/š/	26	38.8
	children	/i/	/iy/	11	16.4
	children	/d/	/g/	13	19.4
	children	/ə/	/e/	14	20.8
	20.3 wash	/š/	/č/	18	26.8
	20.4 their**	/ð/	/d/	15	22.3
	their	/r/	/y/	14	20.8
	20.5 hands	/z/	/∅/	10	14.9

*Grammatical deviation
**Lexical Substitution

Number	Sentence	Rendition by Model	Rendition by Pupil	Number	% of total
21.0	They brush their teeth.				
21.1	They	/ð/	/d/	34	50.7
21.2	brush	/š/	/č/	7	10.4
21.3	their	/r/	/ø/	17	25.3
	their	/ð/	/d/	16	23.8
21.4	teeth	/θ/	/s/	24	35.8
22.0	David gets a little coat.				
22.1	David	/d/	/t/	5	7.4
	David	/v/	/b/	2	2.9
22.2	gets	/z/	/ø/	35	52.2
	gets	/z/	/θ/	13	19.4
22.3	a	/ə/	/ey/	4	5.9
22.4	little	/i/	/iy/	22	32.8
22.5	coat				
23.0	Today they go to school.				
23.1	Today	/ey/	/e/	3	4.4
23.2	they	/ð/	/d/	14	25.3
23.3	go_*	/ /	/-z/	3	4.4
	go	/ow/	/o/	15	22.3
23.4	to				
23.5	school	/s/	/ø/	1	1.4
24.0	Daddy goes to work.				
24.1	Daddy	/æ/	/a/	1	1.4
24.2	goes*	/z/	/ø/	15	22.3
	goes	/ow/	/o/	9	13.4
24.3	to				
24.4	work				
25.0	Mother works at home.				
25.1	Mother	/ð/	/d/	5	7.4
25.2	works	/z/	/ø/	15	23.8
25.3	at				
25.4	home	/ow/	/o/	2	2.9

*Grammatical Variation

Number	Sentence	Rendition by Model	Rendition by Pupil	Number	% of total
26.0	Gloria se baña.				
	26.1 Gloria	/l/	/∅/	4	5.9
	Gloria	/r/	/∅/	4	5.9
	26.2 se				
	26.3 baña	/ƀ/	/v/	24	35.8
27.0	Ella tiene el jabón.				
	27.1 Ella	/y/	/∅/	3	4.4
	27.2 tiene	/i/	/∅/	4	5.9
	27.3 el	/l/	/∅/	6	8.9
	el	/e/	/∅/	2	2.8
	27.4 jabón	/ƀ/	/v/	3	4.4
28.0	Ella tiene jabón en la cabeza.				
	28.1 Ella				
	28.2 tiene	/i/	/∅/	3	4.4
	28.3 jabón	/ƀ/	/v/	3	4.4
	28.4 en				
	28.5 la	/l/	/∅/	9	13.4
	28.6 cabeza	/ƀ/	/v/	3	4.4
29.0	Gloria llora.				
	29.1 Gloria	/l/	/∅/	3	4.4
	29.2 llora				
30.0	El jabon se le metió en los ojos.				
	30.1 El				
	30.2 jabón	/ƀ/	/v/	3	4.4
	30.3 se	/s/	/j/	10	14.9
	30.4 le	/e/	/ə/	10	14.9
	30.5 metió				
	30.6 en				
	30.7 los	/s/	/∅/	10	14.9
	30.8 ojos				

Number	Sentence	Rendition by Model	Rendition by Pupil	Number	% of total
31.0	Tiene jabón en la nariz.				
	31.1 Tiene				
	31.2 jabón				
	31.3 en				
	31.4 la	/l/	/n/	11	16.4
	31.5 nariz	/s/	/∅/	3	4.4
32.0	Gloria tiene un cepillo de dientes.				
	32.1 Gloria	/l/	/∅/	4	5.9
	32.2 tiene				
	32.3 un	/u/	/∅/	4	5.9
	32.4 cepillo	/e/	/ə/	4	5.9
	cepillo	/y/	/∅/	5	7.4
	32.5 de	/d/	/∅/	4	5.9
	32.6 dientes	/d/	/∅/	24	35.8
	dientes	/s/	/∅/	2	2.9
33.0	Se lava los dientes con su cepillo.				
	33.1 Se	/e/	/i/	2	2.9
	33.2 lava				
	33.3 los	/s/	/∅/	16	26.8
	los	/o/	/a/	4	5.9
	33.4 dientes	/d/	/∅/	24	35.8
	dientes	/s/	/∅/	6	10.4
	33.5 con				
	33.6 su				
	33.7 cepillo	/e/	/i/	4	5.9
34.0	Están de rodillas.				
	34.1 Están	/s/	/∅/	6	8.9
	34.2 de	/e/	/ey/	1	1.4
	34.3 rodillas	/s/	/∅/	9	13.4
35.0	Los niños se acuestan.				
	35.1 Los	/s/	/∅/	17	25.3
	35.2 niños	/s/	/∅/	4	5.9
	35.3 se	/e/	/i/		5.9
	35.4 acuestan	/a/	/∅/	16	23.8
	acuestan	/n/	/∅/	4	5.9

Number	Sentence	Rendition by Model	Rendition by Pupil	Number	% of total
36.0	La luz está apagada.				
36.1	La				
36.2	luz				
36.3	está	/e/	/∅/	21	31.3
	está	/s/	/∅/	3	4.4
36.4	apagada	/a/	/∅/	27	40.2
	apagada	/a/	/e/	2	2.9
37.0	Los niños despiertan al bebé.				
37.1	Los	/s/	/∅/	13	19.4
37.2	niños	/s/	/∅/	8	11.9
37.3	despiertan	/s/	/∅/	26	38.8
	despiertan	/i/	/∅/	45	67.1
	despiertan	/d/	/∅/	18	26.8
37.4	al				
37.5	bebé	/ƀ/	/v/	16	23.8
	bebé	/b/	/v/	8	11.9
38.0	Ellos se pueden vestir solos.				
38.1	Ellos	/s/	/∅/	4	5.9
38.2	se				
38.3	pueden	/u/	/∅/	5	7.4
38.4	vestir	/e/	/i/	25	37.3
38.5	solos				
39.0	David puede abotonarse la camisa.				
39.1	David	/d/	/∅/	4	5.9
39.2	puede	/u/	/∅/	11	16.4
39.3	abotonarse	/a/	/∅/	14	20.8
	abotonarse	/ƀ/	/v/	2	2.9
39.4	la				
39.5	camisa				
40.0	Gloria tiene sus zapatos.				
40.1	Gloria				
40.2	tiene	/i/	/∅/	3	4.4
40.3	sus	/s/	/∅/	8	11.9
40.4	zapatos	/s/	/∅/	4	5.9

Number	Sentence	Rendition by Model	Rendition by Pupil	Number	% of total
41.0	El bebé tiene un calcetín en la pierna.				
	41.1 E̲l	/e/	/ø/	2	2.8
	41.2 beb̲é	/ƀ/	/v/	16	23.8
	b̲ebé	/b/	/v/	12	17.9
	41.3 tiene				
	41.4 un				
	41.5 cal̲cetín	/l/	/ø/	3	8.9
	41.6 en				
	41.7 la̲	/a/	/ø/	11	16.4
	41.8 pi̲erna	/i/	/ø/	12	17.9
42.0	Gloria tiene un peine para el cabello.				
	42.1 Gl̲oria	/l/	/ø/	4	5.9
	42.2 tiene				
	42.3 un				
	42.4 peine				
	42.5 para el				
	42.6 cab̲ello	/ƀ/	/v/	11	16.4
43.0	La familia se desayuna.				
	43.1 La̲	/a/	/ /	4	5.9
	43.2 famili̲a	/i/	/ø/	4	5.9
	43.3 se				
	43.4 desayuna				
44.0	Gloria y David beben leche.				
	44.1 Gl̲oria	/l/	/ø/	4	5.9
	44.2 y				
	44.3 Da̲vid	/a/	/ey/	4	5.9
	44.4 beb̲en	/ƀ/	/v/	24	35.7
	44.5 lec̲h̲e	/č/	/š/	7	10.4
45.0	Ellos se lavan los dientes.				
	45.1 Ellos̲	/s/	/ø/	2	2.8
	45.2 se				
	45.3 lavan				
	45.4 los̲	/s/	/ø/	8	11.9
	45.5 d̲ientes	/d/	/ø/	36	53.7

Number	Sentence	Rendition by Model	Rendition by Pupil	Number	% of total
46.0	David toma una chaqueta.				
46.1	David	/ƀ/	/v/	13	19.4
46.2	toma				
46.3	una	/a/	/∅/	4	5.9
46.4	chaqueta	/č/	/š/	4	5.9
47.0	Ellos van a la escuela hoy.				
47.1	Ellos	/s/	/∅/	13	19.4
47.2	van	/ƀ/	/v/	12	17.9
47.3	a				
47.4	la	/a/	/∅/	15	22.3
47.5	escuela	/s/	/∅/	12	17.9
47.6	hoy	/i/	/∅/	14	20.8
48.0	Papá va a trabajar.				
48.1	Papá				
48.2	va	/ƀ/	/v/	17	25.3
48.3	a	/a/	/∅/	17	25.3
48.4	trabajar	/ƀ/	/v/	1	1.4
49.0	Mamá le ayuda a Gloria.				
49.1	Mamá				
49.2	le	/e/	/ə/	11	16.4
49.3	ayuda	/a/	/∅/	22	32.8
49.4	a				
49.5	Gloria				
50.0	Mamá trabaja en casa.				
50.1	Mamá				
50.2	trabaja				
50.3	en				
50.4	casa				

The first column to the right of each individual word shows the phonemic transcription of the underlined part of the word, which shows the way the model pronounced the phoneme. The second column to the right shows the way the children pronounced that same phoneme; the symbol ∅ indicates a phoneme omission by the children. The third column to the right shows the number of children making the error, and the last column gives the figure in percent for both samples combined. Sometimes the same word had several phonemes mispronounced, in which case the word is listed more than once, but each time with a different part underlined. Some words appear with more errors in some places than in others, and sometimes they were pronounced correctly. This variation may be due to an environmental factor.

The investigator used nine categories to score the spelling test. Three of the categories deal with the whole word while the rest deal with the grapheme representation of phonemes:

1. Omission - There was no attempt to spell the word, the space was left blank.
2. Irrational Word - The graphemic representation was incorrect as to position, e.g., shiwher for they.

3. Wrong Word - The child attempted to write at least one phoneme by position but it was the wrong word; e.g., def for David.

4. Rational Substitution - One grapheme was substituted for another; the grapheme represented the phoneme. Example: if a child said bruch and also spelled it with a ch, this rendition was scored in this category.

5. Irrational Substitution - Here were grouped the graphemes representing phonemes irrationally, as chilken for children.

6. Rational Addition - When an additional grapheme was added to the word where one is not generally found. Example: teethe for teeth.

7. Irrational Addition - The addition of a grapheme which does not represent a sound in a word. Example: washed for washes.

8. Rational Omission - Omission of a grapheme which is not considered as necessary for the graphemic representation of a phoneme. Example: tes for teeth.

9. Irrational Omission - The omission of a grapheme which was necessary for the representation of a phoneme within a word. Example: cles for cleans.

The investigator selected for analyses twenty-three specific phoneme/grapheme relationships in English plus fifteen in Spanish. Capital letters were not considered in either language. Neither the tilde over the n in baña, nor accents were considered in Spanish, although several children used both. Also considered was the time factor in testing children: it was decided to keep the spelling test in each language under ten minutes. The inflection of the voice of the model as the individual word and the sample sentences were given were also taken into consideration.

Because of the reasons discussed above, some words in the phonological assessment that showed a higher frequency of occurrence were by-passed in favor of others in making the spelling tests. Other words were used in the spelling tests which were considered to be pronounced within more normal intonational patterns. In all cases except le and están in Spanish, plus /ey/ in English, the phonemes selected for analyses were mispronounced with a frequency of ten percent or more for pupils in both groups. Both tests were of less than ten minutes duration.

These are the categories used for classifying the phonological and graphemic realization of the sound:

1. Correct - The word was pronounced like the model pronounced it and the word was correctly spelled.
2. Omission - The phoneme was omitted when the word was pronounced; the graphemic representation was also omitted.
3. Transposition - The adjacent sounds were reversed; the adjacent letters were also reversed.

4. Omission of Word - The word was not pronounced during the assessment; the word was not attempted during the spelling test.
5. Substitution [illegible] student rendi[illegible] tation appear[illegible]
6. Other - A low [illegible] phoneme or it[illegible]

Analyses of Data

The Control Data Corporation Model 6600 computer at The University of Texas at Austin performed all the statistical computations. The Edstat V Library as well as programs written for this project were utilized for performing analyses.[2]

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[1] Richard E. Sullivan. A Comparison of Certain Relationships Among Selected Phonological Differences and Spelling Deviations For a Group of Negro and a Group of White Second Grade Children. Unpublished doctoral dissertation, The University of Texas at Austin, August, 1971.

[2] Donald J. Veldman, "Edstat V, Basic Statistical Computer Programs for the CDC 6600," R and D Center for Teacher Education, The University of Texas at Austin, Third Revision, Mimeograph; also, Donald J. Veldman, FORTRAN Programming for the Behavioral Sciences. New York: Holt Rinehart, and Winston, 1967.

To answer the question of how the two samples compare on the variables of sex, home language, number of siblings, phonological differences and spelling deviations, the investigator performed three analyses of variance on each of the two samples. In the first analysis, sex was the independent variable with phonological score and spelling score as the dependent variables.

In the second analysis, home language was the independent variable, the phonological score and the spelling score were the dependent variables. For this analysis, the investigator combined both samples. The language used at home in ordinary conversation by the two parents determined the home language for this study: English-English; English-Spanish (or Spanish-English); and Spanish-Spanish.

Number of siblings was the independent variable in the third analysis. Again, the phonological score and the spelling score were the dependent variables. This analysis was done for each sample separately.

To compare monolingual instruction with bilingual instruction, the investigator did an analysis of variance on each of the two samples. The San Antonio sample represented monolingual instruction, and the phonological score and the spelling score were the dependent variables. A similar analysis was done for the Corpus Christi sample, representing bilingual instruction. In addition, the in- [illegible]

The types of spelling deviations were determined for each of the groups based upon the total number of deviations within the group. Comparisons between groups were made using analysis of variance with type of instruction and spelling deviations as independent variables and rational vs. irrational errors and phonological and spelling scores as dependent variables.

A test of proportions was used to determine the degree of differences among the selected phonological differences and spelling deviations within and between samples. Comparisons between samples were made within modes; within sample comparisons were made between modes.

To answer the questions having to do with interference between the two languages in phonology or in spelling, a count was made of the selected phonological and spelling deviations. Results were tabulated for English phonology and Spanish phonology and spelling on the one hand, and for Spanish phonology and English phonology and spelling on the other.

CHAPTER IV

ANALYSIS OF DATA

[illegible]

The first part of the question, how do the two samples compare as to the phonological and spelling scores in English, was answered by counting the number of errors made by each sample, both orally and in spelling, and dividing the number of youngsters into the number of errors in order to obtain a per-pupil ratio. In phonological errors, the Corpus Christi sample averaged three errors per pupil; the San Antonio sample averaged eight errors per pupil. Both samples averaged approximately 8.5 errors per pupil in the number of errors committed in spelling.

Fifteen words in English were also selected for analysis, each of which contained at least one phoneme selected for analysis based on a pronunciation deviancy of 10 percent by both samples. Table 10 shows the results of an analysis of variance with the phonological score on the fifteen words as the dependent variable. The Corpus Christi sample had a significantly higher

TABLE 10

BILINGUAL VS. MONOLINGUAL INSTRUCTION ANALYSIS OF VARIANCE WITH ENGLISH AND SPANISH PHONOLOGICAL MEAN SCORE (TOTAL POSSIBLE = 15) AS THE DEPENDENT VARIABLE FOR A GROUP OF 22 CORPUS CHRISTI AND 45 SAN ANTONIO, TEXAS MEXICAN-AMERICAN SECOND GRADE PUPILS, 1971.

	Bilingual Instruction (Corpus Christi)	Monolingual Instruction (San Antonio)	P
English Mean Score	11.9550	10.5105	.05
Spanish Mean Score	10.2907	10.5239	n.s.

phonological score in English than the San Antonio sample.

Fifteen phonemes in Spanish were selected for analysis based on a pronunciation deviancy of 10 percent by both samples. Fifteen words in Spanish, each containing a phoneme selected for analysis, were pronounced for the phonological score. Table 10 shows the results of the analysis. The difference between mean scores was not significant.

The second part to the question, how do the samples compare as to spelling scores, was answered by counting the number of words correctly spelled by both samples. Fifteen words in English were given to both samples as a spelling test. The Corpus Christi sample also took a spelling test in Spanish consisting of fifteen words. Because only Corpus Christi represented bilingual instruction, no comparison between samples was done as to the score in the Spanish test. Table 11 shows the results of this analysis. The Corpus Christi sample did better in spelling in English than the San Antonio sample, although the difference between score means was not significant.

TABLE 11

BILINGUAL VS. MONOLINGUAL INSTRUCTION ANALYSIS OF VARIANCE WITH ENGLISH AND SPANISH SPELLING MEAN SCORE (TOTAL POSSIBLE = 15 IN EACH) AS THE DEPENDENT VARIABLE FOR A GROUP OF 22 CORPUS CHRISTI AND 45 SAN ANTONIO, TEXAS MEXICAN-AMERICAN SEOND GRADE PUPILS, 1971.

	Bilingual Instruction (Corpus Christi)		Monolingual Instruction (San Antonio)		P
	M	S.D.	M	S.D.	
English	7.1364	4.06	6.5556	3.12	n.s.
Spanish	6.9500	3.39	N/A		

Question Two

The second question, how do the two samples compare on the variable of sex, phonological score in English and in Spanish and spelling score in English,was answered by doing within-group comparisons. Sex was the independent variable with the phonological score in English as the dependent variable in the first analysis. The score in spelling in English was the dependent variable in the second analysis, and the phonological score in Spanish was the dependent variable in the third analysis.

Table 12 shows the relationship of sex to phonological score means in English. Although the difference was not significant in either sample, the girls in the Corpus Christi sample scored better than the boys in Corpus Christi. This higher scoring by the girls did not happen in the San Antonio sample. Table 12 shows the relationship of sex to the phonological score means in Spanish. The girls in both samples scored higher than the boys, although the difference in score means was not significant.

Table 13 shows the comparison of sex to spelling in English and in Spanish. The girls scored somewhat

TABLE 12

COMPARISON OF ENGLISH AND SPANISH PHONOLOGICAL MEAN SCORE (TOTAL POSSIBLE = 15) WITH SEX AS THE DEPENDENT VARIABLE FOR A GROUP OF 22 BILINGUAL INSTRUCTION AND 45 MONOLINGUAL INSTRUCTION PUPILS, CORPUS CHRISTI AND SAN ANTONIO, TEXAS, 1971.

		Males	Females	
Corpus Christi	English	8.3333	9.7000	n.s.
	Spanish	9.8182	10.4444	n.s.
San Antonio	English	9.2143	8.2353	n.s.
	Spanish	9.9694	11.1165	n.s.

TABLE 13

COMPARISON OF ENGLISH AND SPANISH SPELLING MEAN SCORE (TOTAL POSSIBLE = 15) WITH SEX AS THE DEPENDENT VARIABLE FOR A GROUP OF 22 BILINGUAL INSTRUCTION AND 45 MONOLINGUAL INSTRUCTION MEXICAN-AMERICAN SECOND GRADE PUPILS, SAN ANTONIO AND CORPUS CHRISTI, TEXAS, 1971.

	Males	Females	P
Corpus Christi			
English	6.2500	8.2000	n.s.
Spanish	6.5455	7.4444	n.s.
San Antonio			
English	6.5357	6.5882	n.s.
Spanish	N/A	N/A	

higher than the boys in the Corpus Christi sample, but the difference in score means was not significant. Table 13 also shows the girls scoring higher than the boys in Spanish spelling in the Corpus Christi sample. The difference was not significant.

Question Three

Question Three, how do the samples compare as to the language spoken in the home and the phonological and spelling scores in English and the phonological and spelling scores in Spanish, was answered by first combining both samples into one group and dividing the youngsters into three home language groups: group one consisted of youngsters from homes where both parents speak Spanish at home most of the time; group two has one parent speaking Spanish and the other one English most of the time; group three has both parents speaking English at home most of the time.

Table 14 shows the comparison of home language to the phonological score means in English. Youngsters from homes where both parents speak English had a higher phonological score mean than youngsters from families

TABLE 14

COMPARISON OF ENGLISH AND SPANISH PHONOLOGICAL MEAN SCORE (TOTAL POSSIBLE = 15) WITH HOME LANGUAGE AS THE DEPENDENT VARIABLE FOR A GROUP OF 67 MEXICAN-AMERICAN SECOND GRADE PUPILS, CORPUS CHRISTI AND SAN ANTONIO, TEXAS, 1971.

	Spanish-Spanish	Spanish-English	English-English	P
English Mean:	8.1622	9.4000	10.1333	n.s.
Spanish Mean:	9.7273	10.5000	10.6667	n.s.

where one or both parents speak Spanish at home. The difference in the mean scores is not significant. The same results occur when relating Spanish phonological scores to home language; this is also shown in Table 14.

Table 15 shows the relationship of home language to spelling in English. The differences between samples were not significant, although the group where both parents speak English at home scored higher than did the other two groups. In the Corpus Christi sample, youngsters coming from homes where one parent speaks Spanish and the other English had a higher mean score in Spanish spelling than the other two groups. Table 15 also shows this comparison; differences are not significant.

Question Four

Question Four, what is the relationship of the number of siblings at home to phonological scores in English and in Spanish for each sample, and what is the relationship of the number of siblings to the spelling score in English for each sample and spelling in Spanish for the Corpus Christi sample, was answered by grouping the youngsters in each sample into three groups. Group one consisted of youngsters having from one to three

TABLE 15

BETWEEN-SAMPLES COMPARISON OF ENGLISH SPELLING MEAN SCORE AND WITHIN-SAMPLE COMPARISON OF SPANISH SPELLING MEAN SCORE (TOTAL POSSIBLE = 15) WITH HOME LANGUAGE AS THE DEPENDENT VARIABLE FOR A GROUP OF 45 SAN ANTONIO AND 22 CORPUS CHRISTI, TEXAS MEXICAN-AMERICAN SECOND GRADERS, 1971.

	Spanish-Spanish	Spanish-English	English-English	P
Corpus Christi and San Antonio				
English	6.3784	6.8000	7.6000	n.s.
Corpus Christi				
Spanish	6.5455	7.5000	7.3333	n.s.

siblings; group two, youngsters having from four to six siblings at home; and group three, youngsters having from seven to ten siblings at home.

Table 16 compares sibling groups in both samples and phonological score means in English. Both samples showed that youngsters coming from families having one to three siblings had a higher phonological score mean. Table 16 also shows the results of the analysis of a comparison of Spanish phonological score means with number of siblings. In the Corpus Christi sample, youngsters coming from families having the largest number of siblings had a higher phonological score mean than either of the other two groups. The difference in mean scores reached an almost significant level of confidence of .0553. The lowest phonological score mean belonged to the group having from four to six siblings.

Table 17 shows the results of comparing spelling score means in English with the number of siblings. Comparisons were made within samples. In Corpus Christi, as in San Antonio, youngsters from homes having the smallest number of siblings had a higher mean score than pupils coming from homes having either from four to six or seven to ten siblings. The differences were not significant.

TABLE 16

COMPARISON OF ENGLISH AND SPANISH PHONOLOGICAL MEAN SCORE (TOTAL POSSIBLE = 15) WITH NUMBER OF SIBLINGS AS THE DEPENDENT VARIABLE FOR A GROUP OF 22 CORPUS CHRISTI AND 45 SAN ANTONIO MEXICAN-AMERICAN SECOND GRADE PUPILS, 1971

	1-3 Siblings	4-6 Siblings	7-10 Siblings	P
Corpus Christi				
English	11.2000	8.6667	7.4000	n.s.
Spanish	11.6000	8.6364	12.2500	n.s.
San Antonio				
English	10.2727	9.2525	7.1429	n.s.
Spanish	10.4000	10.5426	10.0714	n.s.

TABLE 17

BETWEEN-SAMPLES COMPARISON OF ENGLISH SPELLING MEAN SCORE AND WITHIN-SAMPLE COMPARISON OF SPANISH SPELLING MEAN SCORE (TOTAL POSSIBLE = 15 IN EACH) WITH NUMBER OF SIBLINGS AS THE DEPENDENT VARIABLE FOR A GROUP OF 45 SAN ANTONIO AND 22 CORPUS CHRISTI, TEXAS MEXICAN-AMERICAN SECOND GRADERS, 1971.

	1-3 Siblings	4-6 Siblings	7-10 Siblings	P
SAN ANTONIO AND CORPUS CHRISTI				
English	8.6880	6.6255	5.3685	.05
CORPUS CHRISTI				
Spanish	8.6000	5.7273	8.2500	n.s.

Table 17 also shows the mean spelling score in Spanish and the relationship to the number of siblings. The lowest Spanish spelling score mean belongs to the group having from four to six siblings; the highest, to the group having the least number of siblings. The differences were not significant.

Further analyses were performed with number of siblings data. In four analyses, both samples were collapsed and the Corpus Christi and San Antonio samples were lumped into one sample which was divided into three sibling groups. The four dependent variables in all of the analyses were means on the four fifteen-item sets making up the phonological and spelling tests in both languages.

Table 18 shows that Mexican-American youngsters from families having from one to three siblings scored significantly higher in English than youngsters coming from larger families, possibly because the parents are young or speak some English at home. The higher scores occurred in three out of four analyses. Youngsters from homes having 1-3 siblings scored higher in the category of total number of phonemes correctly pronounced in English, although not significantly higher. A similar analysis in Spanish phonological scores and their relationship to the number of siblings produced different

TABLE 18

COMPARISON OF NUMBER OF SIBLINGS TO PHONOLOGICAL AND SPELLING SCORES IN ENGLISH FOR A COMBINED GROUP OF 67 SECOND GRADE PUPILS IN CORPUS CHRISTI AND SAN ANTONIO, TEXAS, 1971.

	Score Means of Tests			
Four 15-Item Sets (Tests)	1-3 Siblings	4-6 Siblings	7-10 Siblings	P
Phonological Test (Words)	10.5620	9.0315	7.2105	.0252
Phonological Test (Phonemes)	11.8755	10.9995	10.2105	.1916
Spelling Test (Whole Words)	8.6880	6.6255	5.3685	.0150
Spelling Test (Grapheme)	11.2500	9.6870	7.4730	.0074

results. Youngsters from families having the largest number of siblings, 7-10, showed a significantly higher phonological score mean in Spanish pronunciation.

1-3 Siblings	4-6 Siblings	7-10 Siblings	P
11.5995	8.6370	12.2505	.05

The higher score may be due to the larger group in which these children live; this larger group exposes them to more oral Spanish than if they lived in families of small numbers. The same group also scored higher in the spelling test in Spanish when the correct spelling of the whole word was considered. The difference was not significant, however.

Question Five

The total number of errors in spelling in English were counted for each sample in the analysis of rational and irrational errors. Omitted and irrational words were excluded from this analysis. One grapheme had to be correct by position in order for a word to be scored on one of the categories on Table 19. Errors were classified as to errors of omission, substitution, or addition.

TABLE 19

PERCENTAGES AND SIGNIFICANCES OF TOTAL NUMBER OF SPELLING ERRORS IN CATEGORIES OF RATIONAL AND IRRATIONAL SUBSTITUTION, ADDITION AND OMISSION FOR A GROUP OF 22 CORPUS CHRISTI AND 45 SAN ANTONIO, TEXAS MEXICAN-AMERICAN SECOND GRADERS, 1971

Type of Error	Corpus Christi Percent N = 237		San Antonio Percent N = 471		P
Rational Addition	6		5		n.s.
Irrational Addition	6		5		n.s.
Rational Omission	30		21		n.s.
Irrational Omission	20		29		n.s.
Rational Substitution	25		27		n.s.
Irrational Substitution	13		13		n.s.
	100		100		
		P_{R/I_r}		P_{R/I_r}	
Total Rational Deviations	62		53		n.s.
		.05		n.s.	
Total Irrational Deviations	38		47		n.s.
	100		100		

These categories are explained in Chapter III. Each sample had errors in all six categories, and the errors added up to 100 percent of the sample.

Table 19 shows the percentages and significances of the total number of spelling errors in the categories of rational and irrational substitution, addition, and omission. The largest percentage of errors in the Corpus Christi sample occurred in the rational omission category. The largest percentage of errors in the Corpus Christi sample occurred in the omission category where spelling requires a grapheme which may not be a representation of a phonemic rendition. If a mistake was made in spelling, which had as its basis a phonological deviancy considered natural to Mexican-American children speaking Spanish at home, the mistake was labeled rational. The difference between samples as to type of errors was not significant.

Question Six

From the data gathered for the study, it was decided that thirty-eight phoneme/grapheme relationships in both languages, English and Spanish, would be analyzed to answer the question, what are the differences among selected phonological differences and spelling deviations within and between groups in English and in Spanish. The selection of the specific phonemes/graphemes is similar to the selection discussed in Chapter III, except that the /ey/ in David and in they nor the Spanish words le and están did not reach the 10 percent mispronunciation frequency criteria. Table 20 shows the twenty-three selected correspondences in English; Table 21 shows the fifteen selected correspondences in Spanish. A test of proportions was performed to determine statistical significance of the differences between samples.

Consonants and Vowels in English: Between-Samples Comparison, Oral with Oral and Written with Written

Table 22, in tabular form, indicates that between-samples scores were significantly different in the oral rendition of four consonant phonemes, numbers 4, 5, 11 and 13. In all four instances the Corpus Christi sample representing bilingual instruction scored significantly higher than San Antonio, representing instruction in English only. The phonological deviations found in the consonant phonemes in question (and listed in Table 20)

TABLE 20

ENGLISH

TWENTY-THREE SELECTED PHONEME/GRAPHEME CORRESPONDENCES WITH TESTS OF SIGNIFICANCE WITHIN SAMPLES FOR ORAL AND WRITTEN AND BETWEEN SAMPLE COMPARISONS OF ORAL WITH ORAL AND WRITTEN WITH WRITTEN, 22 MEXICAN-AMERICAN PUPILS TAKING BILINGUAL INSTRUCTION (CORPUS CHRISTI) AND 45 MEXICAN-AMERICAN PUPILS TAKING MONOLINGUAL INSTRUCTION (SAN ANTONIO), 1971*

Word	Mode	P_1 (1)	Corpus Christi (N = 22)	Per- cent	$P_{o/w}$		San Antonio (N = 45)	Per- cent	P_1 (4)	P_2 (5)
					C.C. (2)	S.A. (3)				
1. goes	Oral		Correct	82			Correct	69	n.s.	n.s.
			/z/ Omission	14			/z/ Omission	27	n.s.	n.s.
			Word Omission	4			Word Omission	4	n.s.	
	Written		Correct	55	.05	n.s.	Correct	62	n.s.	n.s.
			s Omission	35	.01	n.s.	s Omission	36	n.s.	n.s.
			Word Omission	9			Word Omission	2	n.s.	

*Column (1) reflects the results of a test of proportions comparing the reported percentage to zero, for the Corpus Christi sample, when this sample had a category that did not occur in the San Antonio sample. Column (2) for Corpus Christi and Column (3) for San Antonio report the results of a test of proportions comparing percentages within samples of oral correct with written correct. The difference between the two percentages, oral correct and written correct, was arrived at by classifying the oral and written mistakes made by each child on the selected phoneme/grapheme correspondences. A four by four grid was used to tabulate the results of the phoneme/grapheme count. Each tally fell under one of four squares labeled a, b, c, and d on the grid. The formula used for the test of significance is the one devised by W. McNemar, as quoted by N.M. Downie, Basic Statistical Methods (New York: Harper & Row, 1970). pp. 193-195. The formula reads as follows:

$Z = \sqrt{(a-d)^2/(a+d)}$ where a = the oral was incorrect and the written was correct; b = the oral was correct and the written was also correct; c = the oral was incorrect and the written was also incorrect; d = the oral was correct and the written was incorrect.

The students who got the oral correct may not be the same students who got the written correct. A high correlation of oral to written (as hypothesized) is reported as n.s. Conversely, the lack of correlation between oral correct and written correct is reported as significant. The level of confidence used ranged from .05 to .001. Comparison was also made between deviant modes, within samples. When a deviant phoneme could not be matched to a corresponding deviant grapheme, n/a appears under $P_{o/w}$ column.

Column (4) reports for San Antonio what column (1) reports for Corpus Christi, the results of a test of proportions comparing the reported percentage to zero. In addition, significance levels are also reported under column (4) in between-sample comparison when both samples contained a percentage in a particular category. Between-sample comparisons in column (5) reflect change resulting when "Omission of Word" category was removed and percentages were based upon those who attempted the word.

TABLE 20 (continued)

Word	Mode	P_1 (1)	Corpus Christi (N = 22)	Per-cent	$P_{o/w}$ C.C. (2)	$P_{o/w}$ S.A. (3)	San Antonio (N = 45)	Per-cent	P_1 (4)	P_2 (5)
2. David's	Oral		Correct	77			Correct	67	n.s.	n.s.
			/z/ Omission	14			/z/ Omission	33	n.s.	n.s.
			Word Omission	9						
	Written		Correct	14	.001	.001	Correct	2	n.s.	n.s.
			s Omission	72	.001	.001	s Omission	80	n.s.	n.s.
			Word Omission	14			Word Omission	18	n.s.	
3. David	Oral		Correct	77			Correct	87	n.s.	n.s.
			/b/ Substitution	23			/b/ Substitution	9	.05	n.s.
			Word Omission	0			Word Omission	4	n.s.	
	Written		Correct	77	n.s.	n.s.	Correct	69	n.s.	n.s.
			v Omission	23	n/a	n/a	v Omission	31	.05	n.s.
4. bed	Oral		Correct	100			Correct	78	.05	n.s.
			/t/ Substitution	0			/t/ Substitution	22	.001	n.s.
	Written		Correct	90	n.s.	.05	Correct	93	n.s.	
			t Substitution	5	n.s.	.05	t Substitution	7	n.s.	
		n.s.	Omission	5					n.s.	
5. they	Oral		Correct	86			Correct	62	.05	.05
			/d/ Substitution	9			/d/ Substitution	33	.05	.05
			Word Omission	5			Word Omission	5	n.s.	
	Written		Correct	68	.001	n.s.	Correct	64	n.s.	n.s.
			d Substitution	18	n.s.	n.s.	d Substitution	36	n.s.	n.s.
		n.s.	Other	5						
		n.s.	Word Omission	9						

TABLE 20 (continued)

Word	Mode	F_1 (1)	Corpus Christi (N = 22)	Per-cent	$P_{o/w}$ C.C. (2)	$P_{o/w}$ S.A. (3)	San Antonio (N = 45)	Per-cent	P_1 (4)	P_2 (5)
6. she	Oral	.01	Correct	50			Correct	62	n.s.	
			/č/ Substitution	18			/č/ Substitution	36	n.s.	
			Omission	32			Addition	2	n.s.	
	Written	n.s.	Correct	91	.001	.001	Correct	93	n.s.	n.s.
			Word Omission	9	n/a	n/a	Omission	7	n.s.	
7. hands	Oral		Correct	91			Correct	82	n.s.	
			/d/ Omission	9			/d/ Omission	18	n.s.	
	Written		Correct	82	n.s.	.01	Correct	51	.05	n.s.
			d Omission	18	n.s.	.001	d Omission	38	n.s.	
							Word Omission	11	.05	
8. wash	Oral		Correct	95			Correct	76	.01	.01
			/č/ Substitution	5			/č/ Substitution	12	n.s.	n.s.
			Omission	0			/š/ Omission	10	n.s.	n.s.
							Word Omission	2	n.s.	
	Written	.01	Correct	68	.001	n.s.	Correct	62	n.s.	n.s.
			sh Omission	23	n/a	n.s.	ch Substitution	27	n.s.	
			Word Omission	9			Word Omission	11	n.s.	
9. washes	Oral		Correct	59			Correct	57	n.s.	n.s.
			/z/ Omission	41			/z/ Omission	34	n.s.	n.s.
							Word Omission	9	.05	
	Written		Correct	54	n.s.	n.s.	Correct	68	n.s.	
			s Omission	32	n.s.	n.s.	s Omission	23	n.s.	
			y Substitution	14			y Substitution	9	n.s.	

TABLE 20 (continued)

Word	Mode	P_1 (1)	Corpus Christi (N = 22)	Per- cent	P_o/w C.C. (2)	P_o/w S.A. (3)	San Antonio (N = 45)	Per- cent	P_1 (4)	P_2 (5)
10. children	Oral		Correct	45			Correct	62	n.s.	n.s.
			/š/ Substitution	45			/š/ Substitution	38	n.s.	n.s.
		n.s.	Word Omission	9						
	Written		Correct	68	.001	n.s.	Correct	64	n.s.	n.s.
			ch Omission	9	.05		ch Omission	12	n.s.	n.s.
			sh Substitution	23	n.s.	n.s.	sh Substitution	24	n.s.	
11. brush	Oral		Correct	96			Correct	71	.05	.05
							Word Omission	6	n.s.	
			/č/ Substitution	4			/č/ Substitution	23	.05	.05
	Written		Correct	55	.01	.001	Correct	22	.01	.05
		n.s.	sh Omission	14			Word Omission	11	.05	
			ch Substitution	27	.001	.001	ch Substitution	67	.01	.001
		n.s.	Other	4						
12. teeth	Oral		Correct	91			Correct	71	n.s.	n.s.
							/θ/ Omission	2	n.s.	
			/s/ Substitution	9			/s/ Substitution	27	n.s.	
	Written		Correct	73	.001	n.s.	Correct	60	n.s.	
							th Omission	11	.05	
			s Substitution	18	n.s.	n.s.	s Substitution	29	n.s.	
		n.s.	Addition	9						
13. has	Oral		Correct	86			Correct	53	.01	
		n.s.	/s/ Substitution	14						
							/f/ Substitution	47	.01	
	Written		Correct	73	.05	.001	Correct	80	n.s.	n.s.
			Word Omission	9						
							s Omission	16	.01	
			*f Substitution	18	n.s.	.001	f Substitution	2	.05	.05
							Other	2	n.s.	

*Lexical deviation.

TABLE 20 (continued)

Word	Mode	P_1 (1)	Corpus Christi (N = 22)	Per-cent	$P_{o/w}$ C.C. (2)	$P_{o/w}$ S.A. (3)	San Antonio (N = 45)	Per-cent	P_1 (4)	P_2 (5)
14. with	Oral		Correct	73			Correct	78	n.s.	n.s.
			/s/ Substitution	23			/s/ Substitution	20	n.s.	n.s.
		n.s.	/θ/ Omission	4						
							Word Omission	2	n.s.	
	Written		Correct	73	n.s.	n.s.	Correct	78	n.s.	n.s.
		n.s.	th Omission	4						
						n/a	h Omission	18	n.s.	n.s.
		.01	f Substitution	23	n.s.					
							Word Omission	4	n.s.	
15. cleans	Oral		Correct	87			Correct	76	n.s.	
			/s/ *Omission	9			/s/ *Omission	24	n.s.	
		n.s.	Word Omission	4						
	Written		Correct	55	.05	.05	Correct	49	n.s.	n.s.
			s *Omission	32	.05	.001	s *Omission	40	n.s.	n.s.
		n.s.	d Substitution	9						
							Word Omission	11	.05	
		n.s.	Addition	4						
16. David	Oral		Correct	91			Correct	97	n.s.	
			Word Omission	9			Word Omission	3	n.s.	
	Written		Correct	68	.05	.01	Correct	77	n.s.	n.s.
			i Addition	9			i Addition	4	n.s.	n.s.
		n.s.	e Substitution	5			i Substitution	7	n.s.	
		n.s.	Other -	5			y Addition	7	n.s.	
			Word Omission	13			Word Omission	5	n.s.	

*Lexical deviation.

TABLE 20 (continued)

Word	Mode	P_1 (1)	Corpus Christi (N = 22)	Per-cent	$P_{o/w}$		San Antonio (N = 45)	Per-cent	P_1 (4)	P_2 (5)
					C.C. (2)	S.A. (3)				
17. David	Oral		Correct	91			Correct	49	.01	.01
			Word Omission	9			/iy/ Substitution	44	.01	
							/e/ Substitution	4	n.s.	
							Word Omission	3	n.s.	
	Written	n.s.	Correct	50	.01	n.s.	Correct	56	n.s.	
			e Substitution	17	n/a	n.s.	e Substitution	9	n.s.	
			a Substitution	5			e Addition	2	n.s.	
			i Omission	14			i Omission	15	n.s.	
			Word Omission	14			Word Omission	18	n.s.	
18. washes	Oral		Correct	50			Correct	20	.01	.05
			/iy/ Substitution	41			/iy/ Substitution	78	.01	.05
			Word Omission	9			Word Omission	2	n.s.	
	Written		Correct	64	n.s.	.001	Correct	71	n.s.	n.s.
			i Substitution	9	n.s.	.001	i Substitution	4	n.s.	n.s.
			e Omission	18			e Omission	13	n.s.	
			Word Omission	9			Word Omission	12	n.s.	
19. children	Oral	n.s.	Correct	73			Correct	38	.05	.05
			/iy/ Substitution	5			/u/ Substitution	42	.01	.01
			/i/ Omission	22			/i/ Omission	20	n.s.	
	Written	n.s.	Correct	90	.05	.001	Correct	96	n.s.	n.s.
			y Addition	5	n/a	n/a	e Substitution	2	n.s.	
			i Omission	5			i Omission	2	n.s.	

TABLE 20 (continued)

Word	Mode	PP_1 (1)	Corpus Christi (N = 22)	Per-cent	$P_{o/w}$ C.C. (2)	$P_{o/w}$ S.A. (3)	San Antonio (N = 45)	Per-cent	P_1 (4)	P_2 (5)
20. children			Correct	86			Correct	53	.01	.01
	Oral		/e/ Substitution	5			/e/ Substitution	47	.01	.01
		n.s.	Word Omission	9						
			Correct	68	n.s.	.001	Correct	89	n.s.	n.s.
			Transposition	5			Transposition	7	n.s.	
	Written	n.s.	n Addition	13	n/a					
							a Addition	2	n.s.	
			i Substitution	5		n/a	i Substitution	2	n.s.	
		n.s.	e Omission	9						
21. cleans			Correct	86			Correct	69	n.s.	n.s.
	Oral		/iy/ Omission	9			/iy/ Omission	24	n.s.	n.s.
		n.s.	Word Omission	5						
							/i/ Substitution	7	n.s.	
			Correct	50	.01	n.s.	Correct	62	n.s.	n.s.
			a Omission	27	n/a		a Omission	23	n.s.	n.s.
	Written		i Substitution	18		n/a	i Substitution	2	n.s.	
			e Omission	5			e Omission	2	n.s.	
							Word Omission	11	.05	
22. goes			Correct	90			Correct	76	n.s.	n.s.
	Oral		/o/ Substitute	5			/o/ Substitute	20	n.s.	n.s.
			Word Omission	5			Word Omission	4	n.s.	
			Correct	41	.01	n.s.	Correct	65	.05	.05
			e Omission	40	n/a	n/a	e Omission	24	.001	.01
	Written	n.s.	a Addition	5						
			Transposition	5			Transposition	9	n.s.	
			Word Omission	8			Word Omission	2	n.s.	

TABLE 20 (continued)

					$P_{o/w}$					
Word	Mode	P_1 (1)	Corpus Christi (N = 22)	Per-cent	C.C. (2)	S.A. (3)	San Antonio (N = 45)	Per-cent	P_1 (4)	P_2 (5)
23. they	Oral	n.s.	Correct	90			Correct	98	n.s.	n.s.
			/e/ Substitution	5						
			Word Omission	5			Word Omission	2	n.s.	
	Written		Correct	82	n.s.	n.s.	Correct	96	n.s.	n.s.
			a Substitution	9	n/a	n/a	a Substitution	2	n.s.	n.s.
			Word Omission	9			Word Omission	2	n.s.	

TABLE 21

S P A N I S H

FIFTEEN SELECTED PHONEME/GRAPHEME CORRESPONDENCES WITH TESTS OF SIGNIFICANCE WITHIN SAMPLES FOR ORAL AND WRITTEN (CORPUS CHRISTI) AND BETWEEN SAMPLE COMPARISONS OF ORAL WITH ORAL, 22 MEXICAN-AMERICAN PUPILS TAKING BILINGUAL INSTRUCTION. CORPUS CHRISTI) AND 45 MEXICAN-AMERICAN PUPILS TAKING MONOLINGUAL INSTRUCTION (SAN ANTONIO), 1971.*

Word	Mode	P_1 (1)	Corpus Christi (N = 22)	Per-cent	$P_{o/w}$ C.C. (2)	$P_{o/w}$ S.A. (3)	San Antonio (N = 45)	Per-cent	P_1 (4)	P_2 (5)
1. ya	Oral		Correct	50			Correct	64	n.s.	n.s.
			/v/ Substitution	36			/v/ Substitution	20	n.s.	n.s.
			Word Omission	14			Word Omission	7	n.s.	
							/v/ Omission	4	n.s.	
							/f/ Substitution	4	n.s.	
	Written		Correct	73	.05	n/a				
			b Substitution	18	.01					
			Word Omission	9						

*Column (1) reflects the results of a test of proportions comparing the reported percentage to zero, for the Corpus Christi sample, when this sample had a category that did not occur in the San Antonio sample. Column (2) for Corpus Christi, column (3) N/A for San Antonio, reports the results of a test of proportions comparing percentages within sample of oral correct with written correct. The differences between the two percentages, oral correct and written correct, was arrived at by classifying the oral and written mistakes made by each child on the selected phoneme/grapheme correspondences. A four by four grid was used to tabulate the results of the phoneme/grapheme count. Each tally fell under one of four squares labeled a, b, c, and d on the grid. The formula used for the test of significance is the one devised by W. McNemar, as quoted by N. M. Downie, Basic Statistical Methods (New York: Harper & Row, 1970), pp. 193-195. The formula reads as follows:

$$Z = \sqrt{(a-d)^2/(a+d)}$$

where a = the oral was incorrect and the written was correct; b = the oral was correct and the written was also correct; c = the oral was incorrect and the written was also incorrect; d = the oral was correct and the written was incorrect.

The students who got the oral correct may not be the same students who got the written correct. A high correlation of oral to written (as hypothesized) is reported as n.s. Conversely, the lack of correlation between oral correct and written correct is reported as significant. The level of confidence used ranged from .05 to .001. Comparison was also made between deviant modes, within samples. When a deviant phoneme could not be matched to a corresponding deviant grapheme, n/a appears under $P_{o/w}$ column.

Column (4) reports for San Antonio what column (1) reports for Corpus Christi, the results of a test of proportions comparing the reported percentage to zero. In addition, significance levels are also reported under column (4) in between-sample comparison when both samples contained a percentage in a particular category. Between-sample comparisons in column (5) reflect change resulting when "Omission of Word" category was removed and percentages were based upon those who attempted the word.

TABLE 21 (continued)

Word	Mode	P_1 (1)	Corpus Christi (N = 22)	Per-cent	$P_{o/w}$ C.C. (2)	$P_{o/w}$ S.A. (3)	San Antonio (N = 45)	Per-cent	P_1 (4)	P_2 (5)
2. baña	Oral		Correct	23			Correct	76	.001	.001
			/v/ Substitution	59			/v/ Substitution	24	.01	.01
		n.s.	Other	4						
		n.s.	Omission of Word	14						
	Written		Correct	45	.01	n/a				
			v Substitution	41	n.s.					
			Omission of Word	14						
3. el	Oral		Correct	77			Correct	93	n.s.	n.s.
			/i/ Substitution	5			/i/ Substitution	4	n.s.	n.s.
			Omission				Omission	2	n.s.	
		.05	Omission of Word	18						
	Written		Correct	82	n.s.	n.a.				
			Omission	5	n/a					
			Omission of Word	13						
4. la	Oral		Correct	64			Correct	73	n.s.	n.s.
							/n/ Substitution	20	.01	
			/l/ Omission	18						
			Omission of Word	18			Omission of Word	7	n.s.	
	Written		Correct	77	n.s.	n.a.				
			1 Omission	14	n.s.					
			Omission of Word	9						

TABLE 21 (continued)

Word	Mode	P_1 (1)	Corpus Christi (N = 22)	Per- cent	$P_{o/w}$ C.C. (2)	$P_{o/w}$ S.A. (3)	San Antonio (N = 45)	Per- cent	P_1 (4)	P_2 (5)
5. le	Oral		Correct	41			Correct	76	.01	.05
		.001	e Omission	45			/ə/ Substitution	22	.001	
		n.s.	Omission of Word	14			Transposition	2	n.s.	
	Written		Correct	82	.001	n.a.				
			1 Addition	5	n/a					
			Omission of Word	13						
6. ayuda	Oral		Correct	41			Correct	69	.05	n.s.
			/e/ Substitution	9			/e/ Substitution	7	n.s.	n.s.
			/a/ Omission	32			Omission	24	n.s.	n.s.
		.05	Omission of Word	18						
	Written		Correct	77	.001	n.a.				
			a Omission	9	.001					
			Omission of Word	14						
7. están	Oral		Correct	73			Correct	88	n.s.	n.s.
			/i/ Substitution	5						
			/s/ Omission	5			/s/ Omission	12	n.s.	n.s.
		.05	Omission of Word	18						
	Written		Correct	77	n.s.	n.a.				
			s Omission	14	.05					
			Omission of Word	9						

TABLE 21 (continued)

Word	Mode	P_1 (1)	Corpus Christi (N = 22)	Per-cent	$P_{o/w}$ C.C. (2)	$P_{o/w}$ S.A. (3)	San Antonio (N = 45)	Per-cent	P_1 (4)	P_2 (5)
8. los	Oral		Correct	55			Correct	76	n.s.	n.s.
			/s/ Omission	27			/s/ Omission	22	n.s.	n.s.
		.05	Omission of Word	18			Omission of Word			
							Addition	2	n.s.	
	Written		Correct	77	.05	n.a.				
			s Omission	9	.01					
			Omission of Word	14						
9. está	Oral		Correct	73			Correct	58	n.s.	.05
			/e/ Omission	9			/e/ Omission	42	.01	.05
		.05	Omission of Word	18						
	Written		Correct	73	n.s.	n.a.				
			e Omission	14	n.s.					
			Omission of Word	13						
10. niños	Oral		Correct	77			Correct	87	n.s.	n.s.
			/s/ Omission	5			/s/ Omission	13	n.s.	n.s.
		.05	Omission of Word	18						
	Written		Correct	73	n.s.	n.a.				
			s Omission	14	.05					
			Omission of Word	13						
11. vestir	Oral		Correct	45			Correct	67	n.s.	n.s.
			/i/ Substitution	36			/i/ Substitution	29	n.s.	n.s.
		.05	Omission of Word	18			Omission	4	n.s.	
	Written		Correct	73	.01	n.a.				
			i Substitution	9	.001					
			Omission of Word	18						

TABLE 21 (continued)

Word	Mode	P_1 (1)	Corpus Christi (N = 22)	Per-cent	$P_{o/w}$ C.C. (2)	$P_{o/w}$ S.A. (3)	San Antonio (N = 45)	Per-cent	P_1 (4)	P_2 (5)
12. pierna	Oral		Correct	77			Correct	64	n.s.	n.s.
			/i/ Omission	5			/i/ Omission	22	n.s.	n.s.
			Other	4			Transposition	11	.05	
			Omission of Word	14			Omission of Word	2	n.s.	
	Written		Correct	18	.001	n.a.				
			i Omission	73	.001					
			Omission of Word	9						
13. beben	Oral	n.s.	Correct	36			Correct	47	n.s.	n.s.
			/v/ Substitution	45			/v/ Substitution	31	n.s.	n.s.
			Other	5						
							/b/ Omission	20	.01	
			Omission of Word	14			Omission of Word	2	n.s.	
	Written		Correct	50	n.s.	n.a.				
			v Substitution	36	n.s.					
			Omission of Word	14						
14. dientes	Oral		Correct	55			Correct	40	n.s.	n.s.
			/d/ Omission	27			/d/ Omission	53	.05	n.s.
			/l/ Substitution	4			/l/ Substitution	2	n.s.	n.s.
			Omission of Word	14			Omission of Word	4		
	Written		Correct	32	.05	n/a				
			th Substitution	50	.01					
			Omission of Word	18						

TABLE 21 (continued)

Word	Mode	P_1 (1)	Corpus Christi (N = 22)	Per-cent	$P_{o/w}$ C.C. (2)	$P_{o/w}$ S.A. (3)	San Antonio (N = 45)	Per-cent	P_1 (4)	P_2 (5)
15. ellos	Oral		Correct	68			Correct	76	n.s.	n.s.
			/j/ Substitution	4						
			Omission of Word	14			Omission of Word	2	n.s.	
			Omission	14			Addition	2	n.s.	
	Written		Correct	72	n.s.	n/a				
			s Omission	14	n/a					
			Omission of Word	14						

are typical of pronunciation deviancies committed by Spanish speakers learning English after starting school at about age six. The higher score demonstrated by Corpus Christi may be an indication of the advantage of having bilingual instruction where English is taught orally at first, with more emphasis placed on listening and on speaking skills.

Between-samples scores were significantly different in the oral rendition of four vowel phonemes, numbers 17, 18, 19, and 20, and again the Corpus Christi sample scored higher than the San Antonio sample. The one instance in which San Antonio scored higher was in the vowel phoneme in number 22, in which the score for written was higher than for oral. Phonological errors in vowel phonemes include: (1) being unable to pronounce the schwa, (2) being unable to pronounce the /ow/ in goes, and (3) being unable to pronounce the short /i/ sound as in the word David. These devancies are typical of Spanish-speaking persons learning English.

Linguistic Relatedness within Samples of Phoneme/Grapheme Correspondence, Vowels and Consonants in English

Oral-to-written correct relatedness was found in half of the vowels analyzed and in two-thirds of the consonants as shown on Table 20. There is a phoneme/grapheme correspondence in 65 percent of the phonemes in the Corpus Christi sample which have a significant relationship. The percentage figure for San Antonio is forty-eight.

The most oral-to-written correspondence in the consonants for the two samples occurred in the final /z/ sibilant to the final s grapheme. See numbers 1, 2, 9, 13, and 15 in Table 22. The next highest relatedness occurred between the /š/ phoneme and the sh grapheme, numbers 6 and 8, Table 22.

In the vowel phoneme/grapheme relationship, the most correspondence occurred between the schwa phoneme and the e grapheme as shown in numbers 18 and 20, Table 22. Another relationship occurred between the /e/ and the e as seen in number 23, Table 22.

For both samples combined, in both consonants and vowels, there was positive oral-to-written relationship 54 percent of the time. For the Corpus Christi

TABLE 22

SIGNIFICANT RELATEDNESS BETWEEN SAMPLES, ORAL WITH ORAL AND/OR WRITTEN WITH WRITTEN, PLUS SIGNIFICANT RELATEDNESS WITHIN SAMPLES OF ORAL-TO-WRITTEN CORRESPONDENCE, CONSONANTS AND VOWELS IN ENGLISH

Phoneme/ Grapheme (Refer to Table 22)	Corpus Christi Percent Correct (N = 22)	$P^{1}_{o/w}$ C.C.*	$P^{2}_{o/w}$ S.A.*	San Antonio Percent Correct (N = 45)	P
1 /z/	82			69	n.s.
in goes		n.s.	n.s.		
s	55			62	n.s.
2 /z/	77			67	n.s.
in David's		n.s.	n.s.		
s	14			2	n.s.
3 /v/	73			87	n.s.
in David		n.s.	n.s.		
v	100			89	n.s.
4 /d/	100			78	.05
in bed		.05	n.s.		
d	90			93	n.s.
5 /ð/	86			62	.05
in they		n.s.	.001		
th	68			64	n.s.
6 /š/	50			62	n.s.
in she		n.s.	n.s.		
sh	91			93	n.s.

*P^1 for Corpus Christi and P^2 for San Antonio report the results of a test of proportions comparing percentages within samples of oral correct with written correct. A high correlation of oral to written is indicated by n.s. while a lack of correlation between modes is reported as significant at the levels .001, .01 or .05. P^1 and P^2 are not computed simply by comparing oral correct with written correct; rather, the formula involves comparing (a) oral incorrect/written correct with (b) oral correct/written incorrect. A test of proportions formula is found on Table 20. Refer to appendix for data used in a test of proportions comparing oral deviancies with spelling errors.

TABLE 22 (continued)

Phoneme/ Grapheme (Refer to Table 22)	Corpus Christi Percent Correct (N = 22)	$^{1}P_{o/w}$ C.C.*	$^{2}P_{o/w}$ S.A.*	San Antonio Percent Correct (N = 45)	P
7 /d/	91			82	n.s.
in hands		.01	.001		
d	82			51	.05
8 /š/	59			58	n.s.
in wash		n.s.	n.s.		
sh	55			62	n.s.
9 /z/	86			71	n.s.
in washes		n.s.	n.s.		
s	68			53	n.s.
11 /š/	96			71	.05
in brush		.05	.01		
sh	55			22	.01
12 /θ/	91			71	n.s.
in teeth		n.s.	n.s.		
th	73			60	n.s.
13 /z/	86			53	.01
in has		n.s.	.05		
s	73			80	n.s.
15 /z/	87			76	n.s.
in cleans		n.s.	n.s.		
s	55			49	n.s.
		Vowels			
17 /i/	91			49	.01
in David		.01	.05		
i	50			56	n.s.
18 /ə/	50			20	.01
in washes		n.s.	n.s.		
e	64			71	n.s.

TABLE 22 (continued)

Phoneme/ Grapheme (Refer to Table 22)	Corpus Christi Percent Correct (N = 22)	$P^{1}_{o/w}$ C.C.*	$P^{2}_{o/w}$ S.A.*	San Antonio Percent Correct (N = 45)	P
19 /i/	73			38	.05
in children		n.s.	.001		
i	90			96	n.s.
20 /ə/	86			53	.05
in children		n.s.	.001		
e	68			89	n.s.
22 /ow/	90			76	n.s.
in goes		.001	.001		
o	41			65	.05
23 /e/	90			98	n.s.
in they		n.s.	n.s.		
e	82			96	n.s.

sample the breakdown is 66 percent for consonants and 50 percent for vowels. For San Antonio the breakdown is 60 percent for consonants and 25 percent for vowels regarding phoneme/grapheme relatedness.

There is closer relationship between phoneme/grapheme correspondence in consonants than in vowels, as shown on Table 20 and on Table 22. The reason seems to be that consonants do not have the pronunciation deviancies that vowels have.

Most of the oral deviations among these Mexican-American youngsters may be attributed to linguistic differences between English and Spanish. Apparently both samples are able to relate the English /z/ phoneme, which is not common to Spanish, to the *s* grapheme which is common to both languages. Youngsters did not seem to have difficulty relating the English /š/ phoneme to the *sh* grapheme. The /š/ also is not common in Spanish.

Both samples had about the same number of consonant phoneme/grapheme relationships, 66 percent for Corpus Christi vs. 60 percent for San Antonio. The Corpus Christi sample had a 50 percent relatedness for vowel phonemes/graphemes while the San Antonio sample only had 25 percent relatedness. Perhaps the difference is due to the type of ESL (English as a second language) instruction used with the Corpus Christi sample. It appears that Corpus Christi youngsters have developed a keener sense of listening which in turn helps to pronounce English better. Apparently correct pronunciation is related to correct spelling and incorrect pronunciation or even linguistic interference is related to incorrect spelling.

The Vowels

In the long a of David, word 16, there does not seem to be a relationship between pronouncing the /ey/ and writing the grapheme a. The Corpus Christi sample shows 5 percent writing the grapheme e, which happens to have the same initial sound in Spanish but is lacking the diphthong quality of the missing /y/ that accompanies the phoneme. Thirteen percent of the Corpus Christi sample failed to attempt the written grapheme a.

In word 17 the phoneme/grapheme relationship of the i in David is studied. Again the Corpus Christi sample scored significantly higher than the San Antonio sample in the pronunciation of the /i/. In addition, the San Antonio sample substituted an /iy/ a significant number of times; none in the Corpus Christi sample did a similar substitution. The 17 percent in the Corpus Christi sample that substituted an _e_ for the _i_ grapheme may have been influenced by Spanish spelling.

The /ə/ in word 18, _washes_, was pronounced significantly better by the Corpus Christi sample than by the San Antonio sample. Both samples pronounced the phoneme as /iy/, a characteristic of the Mexican-American who speaks English with a Spanish pronunciation, but the San Antonio sample used the pronunciation significantly more times than the Corpus Christi sample. A total of 13 percent in both samples substituted the grapheme _i_.

Word 19 compares the relationship of the /i/ to the _i_ in the word _children_. The Corpus Christi sample pronounced the /i/ significantly better than the San Antonio sample. In addition, the San Antonio sample substituted a /u/ a significant number of times. There is a significant relationship between correctly pronouncing and correctly writing the phoneme-grapheme as far as the Corpus Christi sample goes. In the San Antonio sample only 38 percent pronounced the phoneme correctly, yet 96 percent spelled the grapheme correctly in the spelling test.

Word 20 compares the oral/written relationship in the /ə/ in the second syllable of the word children. The Corpus Christi sample pronounced the /ə/ significantly better than the San Antonio sample. The fact that the San Antonio sample pronounced the phoneme as an /e/ a significant number of times may indicate that the youngsters are pronouncing the phoneme with a short vowel sound, similar to the way the grapheme is written. Once again there seems to be a relationship between the phoneme and the grapheme as they are pronounced and written in the Corpus Christi sample. In the San Antonio sample, however, there does not appear to be a relationship between 53 percent pronouncing the phoneme correctly and 89 percent of the students writing the grapheme correctly in the spelling test.

In word 21, both samples pronounce the /iy/ phoneme correctly most of the time. There appears to be a larger part of the San Antonio sample omitting the pronunciation of the /iy/ phoneme. Also, there were more pupils in the San Antonio sample who omitted the grapheme during the spelling test. Twenty-seven percent in the Corpus Christi sample and 23 percent in the San Antonio sample failed to write the a grapheme in the word cleans.

The reason for the omission of the a may be that the pupils have not learned the spelling of the long e as one being written with the ea combination in cleans.

In word 22, goes, the samples pronounced the /ow/ like the Spanish /o/, although the number of times was not significant. A significant number of pupils in the Corpus Christi sample failed to write the e. The pupils wrote gos for goes: 40 percent in the Corpus Christi sample and 24 percent in the San Antonio sample. The transposition reported in both samples in the spelling has to do with spelling the word goes as gose.

In word 23, there appears to be a relationship between the way the /e/ and the e in the way the phoneme is pronounced and spelled. In the spelling test, 9 percent in Corpus Christi and 2 percent in San Antonio spelled the word they with an a. Perhaps the pupils were thinking about the sound in isolation of the first letter of the alphabet as they attempted to spell the word during the spelling test.

Consonants and Vowels in Spanish: Between-Samples Comparison, Oral with Oral and Within-Sample Oral-to-Written Comparison

The San Antonio sample significantly out performed the Corpus Christi sample in the pronunciation of the Spanish phonemes /b/ as in baña, /e/ as in le, and the first /a/ in the word ayuda (helps). See words 2, 5, and 6, Table 21 and Table 23. Perhaps the higher scoring of the San Antonio sample in pronouncing Spanish can be attributed to the youngsters trying harder. Using Spanish as a language of instruction in the setting of the San Antonio sample may have been a novelty to the youngsters, to the extent that they scored higher in Spanish phonology.

There seems to be a positive correlation in the Corpus Christi sample between the following phoneme/grapheme correspondences: (1) the /v/ and the v in va (goes); (2: the /l/ and l in the word el (the), word three; (3) the l consonant in the word la (the), word four; (4) the final /s/ and s in the word los (the), word eight; and (5) the /e/ and e in está (is), word nine.

The San Antonio sample pronounced the /b/ in baña (bathes), the /e/ in le (a pronoun), and the first /a/ in ayuda (helps) significantly better than the Corpus

TABLE 23

SIGNIFICANT DIFFERENCES BETWEEN SAMPLES, ORAL WITH ORAL, PLUS SIGNIFICANT RELATIONSHIPS WITHIN SAMPLE (FOR CORPUS CHRISTI) OF ORAL-TO-WRITTEN CORRESPONDENCE, CONSONANTS AND VOWELS IN SPANISH

Phoneme/ Grapheme	Corpus Christi Percent	$P^1_{o/w}$ C.C.	$P^2_{o/w}$ S.A.	San Antonio Percent	P
1 /v/	50			64	n.s.
in va		n.s.	n/a		
v	73			n/a	
2 /b/	23			76	.001
in baña		.05	n/a		
b	43			n/a	
3 /l/	77			93	n.s.
in el		n.s.	n/a		
l	82			n/a	
4 /l/	64			73	n.s.
in la		n.s.	n/a		
l	77			n/a	
5 /e/	41			76	.01
in le		n.s.	n/a		
e	82			n/a	
6 /a/	41			69	.05
in ayuda		.001	n/a		
a	77			n/a	
8 /s/	55			76	n.s.
in los		n.s.	n/a		
s	77			n/a	
9 /e/	73			58	n.s.
in esta		n.s.	n/a		
e	73			n/a	
12 /i/	77			64	n.s.
in pierna		n.s.	n/a		
	18			n/a	

*P^1 for Corpus Christi and P^2 for San Antonio report the results of a test of proportions comparing percentages within sample of oral correct with written correct (not applicable to San Antonio). A high correlation of oral to written is indicated by n.s. See Table 20.

Christi sample. See words 2, 5, and 6 on Table 25. The San Antonio sample is not using Spanish as a medium of instruction, as is the case in Corpus Christi, therefore, the San Antonio sample did not take the spelling test in Spanish.

The relatedness of oral-to-written for the Corpus Christi sample is evident in words number 1, 3, 4, 5, 8, 9, and 12 on Table 23. The correspondence accounts for 47 percent of the Spanish words in the spelling test. The most oral-to-written correspondence occurred in the /l/ and l, and the /e/ and e relationships, words 3, 4, 5, and 9.

Table 24 shows relatedness between oral deviancies and spelling errors. Relatedness is manifest by one or both samples in fourteen phonemes/graphemes found in some of the twenty-three words taken from Table 20. A comparison is made between a specific deviant phoneme and its specific written counterpart. When the phoneme was not pronounced and its grapheme was also left blank, a ∅ appears to indicate omitted. Several times a /∅/ phoneme was related to a ∅ grapheme; no attempt was made to relate /∅/ phoneme to a specific written grapheme or vice versa.

TABLE 24

DEVIANT PHONEMES/GRAPHEMES IN ENGLISH WHICH WERE ANALYZED FOR RELATEDNESS*, CORPUS CHRISTI AND SAN ANTONIO, TEXAS, 1973

Word as found in Table 22	Corpus Christi phonemic/graphemic deviancy	C.C. $P_{o/w}$**	San Antonio phonemic/graphemic deviancy	S.A. $P_{o/w}$**
Greater > Less <	1 = Omission; 2 = Substitution; 3 = Addition			
1 goes	/z/ 1 < s 1	.01	/z/ 1 < s 1	n.s.
2 David's	/z/ 1 < s 1	.001	/z/ 1 < s 1	.001
3 David	/b/ 2 > none	n/a***	/b/ 2 < v 1	n.s.
4 bed	none < t 2	n/a	/t/ 2 > t 2	.001
5 they	/đ/ 2 < d 2	n.s.	/đ/ 2 < d 2	n.s.
6 she	/č/ 2 > none	n/a	/č/ 2 > none	n/a***
7 hands	/đ/ 1 < d 1	n.s.	/đ/ < d	.001
8 wash	/č/ 2 < sh 1	n/a	/č/ 2 < ch 2	n.s.
9 washes	/z/ 1 < s 1	n.s.	/z/ 1 < s 1	n.s.
10 children	/š/ 2 > sh 2	.01	/š/ 2 > sh 2	.05
11 brush	/č/ 2 < ch 2	.001	/č/ 2 < ch 2	.001
12 teeth	/s/ 2 < s 2	n.s.	/s/ 2 < s 2	n.s.
13 has	/s/ 2 < f 2	n.s.	/f/ 2 > f 2	.001
14 with	/s/ 2 = f 2	n.s.	/s/ 2 < t 2	n.s.
15 cleans	/z/ 1 < s 1	.001	/z/ 1 < s 1	.001
16 David	none < i 3	n/a	none < i 3	n/a
17 David	none < e 2	n/a	/iy/ 2 > e 2	n.s.
18 washes	/iy/ 2 > i 2	.001	/iy/ 2 > i 2	.001
19 children	/iy/ 2 = y 3	n.s.	/u/ 2 > none	n/a
20 children	/e/ 2 > none	n/a	/e/ 2 > none	n/a
21 cleans	/iy/ 1 < a 1	.001	/iy/ 1 > a 1	n.s.
22 goes	/o/ 2 < e 1	.001	/o/ 2 < e 1	n.s.
23 they	/e/ 2 < a 2	n.s.	none < a 2	n/a

*For example, in goes, the /z/ omission was reflected in spelling when final s was omitted.

**Relatedness is assumed when difference between modes is not significant and is indicated as n.s.

***When relatedness between modes was not attempted, e.g., no b substitution was made corresponding to /b/ in word 3; no t substitution was related to /t/ in word 4 for Corpus Christi; no ch substitution was made corresponding to /ch/ in word 6, and similar instances on this table, n/a appears in the $P_{o/w}$ column.

In word 13, has, for Corpus Christi, the relationship was made between the /s/ phoneme and an f grapheme, and this is indicated as a lexical deviation. Word 14, with, relates the deviant /s/ phoneme to the f grapheme for Corpus Christi and to the t grapheme for San Antonio; each sample rendered the written spelling differently. Perhaps there is a dialectical difference between the two Mexican-American communities, Corpus Christi and San Antonio, Texas.

Each sample had ten words (although not necessarily the same ones) showing a P of n.s. (not significant). The ten words account for 43 percent of the English phonemes.

Table 25 shows that oral deviancy in Spanish is related to 73 percent of the phonemes analyzed. Many sounds were left unpronounced and were also left off in spelling. Relatedness was evident between /v/ and v in words 2 and 13.

These Spanish-speaking youngsters' spelling in English is affected by the way they hear the language. Initial /ð/ of they is heard as /d/, and so it is spelled. The final voiceless /θ/ is heard as /s/ and is so reflected

TABLE 25

SELECTED DEVIANT PHONEME/GRAPHEMES IN SPANISH WHICH WERE ANALYZED FOR RELATEDNESS*, CORPUS CHRISTI, TEXAS, 1973

Word as found in Table 23	phonemic/graphemic deviancy	$P_{o/w}$ **
Greater > Less	(1)= Omission (2)= Substitution	(3)= Addition
1 va	(2) /v/ > b (2)	n.s.
2 baña	(2) /v/ > v (2)	n.s.
4 la	(1) /∅/ > ∅ (1)	n.s.
6 ayuda	(1) /∅/ > e (1)	n.s.
7 están	(1) /∅/ < ∅ (1)	n.s.
8 los	(1) /∅/ > ∅ (1)	n.s.
9 está	(1) /∅/ < ∅ (1)	n.s.
10 niños	(1) /∅/ < ∅ (1)	n.s.
11 vestir	(2) /i/ > i (2)	n.s.
13 beben	(2) /v/ > v (2)	n.s.
14 dientes	(1) /∅/ < th(2)	n.s.

*For example, in vestir, the /i/ substitution was reflected in spelling when youngsters used the i grapheme in the first syllable.

**Relatedness is assumed when difference between modes is not significant; this is indicated as n.s.

in its spelling. Both of these sounds are not common to Spanish. Also not common to Spanish is the final /z/ sibilant as in the words *goes*, *washes*, and *has*. In such instances it is possible that youngsters will leave off the final spelling of the sibilant. Since their ear is unaccustomed to distinguishing the /č/ and /š/ phonemes, words in English calling for one spelling will get the other; this happened in the words *children* and *wash*.

Around 40 percent of the spelling errors in English of these youngsters have a linguistic basis. They spell the way they speak, and they speak the way they hear. Spelling instruction in English may be improved by using oral language practice, e.g., an oral method of contrasting minimal pairs of troublesome sounds: /š/ and /č/, final /z/ and final /s/, voiced initial /ð/ as in *they* and final voiceless /θ/ as in *teeth* and *with*.

Some of the errors seem to be of a lexical nature, as is the case with pronouncing the word *has* as *haf* (have). The word *with* being pronounced as *wif* may be an indication of something else besides a phonological deviancy; *wif* appeared not phonologically but rather in spelling the word.

Deviant Phoneme/Grapheme Relatedness, English

Word 1, goes, /z/ < s Omission. There appears to be sufficient relatedness, in the San Antonio sample only, between the omission of the final /z/ sibilant and omitting, in spelling, the final s in the word. Perhaps youngsters do not write the s because they do not sound the /z/. Oral practice in pronouncing the /z/ sibilant may help in spelling the word correctly. Youngsters also seem to have difficulty in inflecting the third person singular verb in English; perhaps the relationship in this case is syntactical.

Word 2, David's, /z/ < s Omission. Many more children omitted the s in spelling (difference not related at the .001 level of confidence) in both samples than they did in pronouncing the final /z/ sibilant counterpart. The reason, like on the word above, is perhaps that youngsters do not hear the sibilant sound of the /z/. Additional oral practice on the sibilants may help Mexican-American youngsters spell better.

Word 3, David, /b/ Substitution > v Omission. No comparison was made between modes for Corpus Christi since all youngsters spelled the grapheme correctly.

Youngsters in San Antonio who substituted a /b/ omitted the v grapheme. No logical explanation occurs to the writer for this phenomenon.

Word 4, bed, /t/ > t Substitution. Mispronouncing the final /t/ in the word appears to have little relation to spelling the word correctly.

Word 5, they, /d/ < d Substitution. There appears to be sufficient deviancy relatedness for both samples in the way the phoneme/grapheme is pronounced and spelled. Initial /ð/ is not common to Spanish as in this word; typically speakers of Spanish substitute a /d/. More oral practice in pronouncing the initial /ð/ may help youngsters in spelling the th grapheme.

Word 6, she, /č/ > Word Omission. No comparison between modes was attempted for either sample in this word because, when the grapheme was attempted it was correctly spelled. Short words such as this one do not appear to be a problem in spelling.

Word 7, hands, /d/ < d Omission. There seems to be relatedness between modes for the Corpus Christi sample in this word. The /dz/ is not common to Spanish.

Oral practice of this combination may help youngsters to spell the *d* in this environment.

Word 8, wash, /č/ < ch Substitution. Deviancy between modes appears to be related in the San Antonio sample. Youngsters will substitute the /č/ for the /š/ if they cannot hear the difference. Oral practice of the initial /š/ should improve the spelling of the corresponding *sh* graphemes in this word.

Word 9, washes, /z/ < s Omission. There appears to be sufficient relatedness in both samples in omitting both the phoneme and its corresponding grapheme in this word. This may be a syntactical variation since the word is the third person singular of a verb and a Spanish-speaking person may fail to make the inflected change needed. Practice in oral rendition of a third person verb form may help Mexican-American children in spelling.

Word 10, children, /š/ > sh Substitution. Some of the youngsters who mispronounced the phoneme still spelled the word correctly (difference not related at the .05 level of confidence). Mexican-American youngsters fail to hear, and thus to pronounce, a difference between /č/

and /š/. Oral practice contrasting the two sounds may help in the spelling of both by these children.

Word 11, brush, /č/ < ch Substitution. Few youngsters mispronounced the final /s/ (difference not related at the .001 level of confidence), but many spelled the digraph using *ch*. Spanish uses only the *ch* spelling. This factor plus the inability as yet to make a choice of *sh* over *ch* may make these youngsters choose the wrong digraph in English. Oral drills contrasting the two sounds may help youngsters in spelling, particularly Mexican-Americans learning English as a second language.

Word 12, teeth, /s/ < s Substitution. There appears to be sufficient relatedness between deviant modes in this word. Final /θ/ is not common in the Spanish dialect of these youngsters. Also, the irregular plural of the word which does not have a final *s* is pronounced and spelled with one by these youngsters. The reason for the deviancy may also be syntactical. Oral practice of the final voiceless /θ/ may help in spelling its corresponding *th* counterpart for these Mexican-American children.

Word 13, has, /s/ < f Substitution. There is relatedness, in the Corpus Christi sample, in phoneme/grapheme deviancy relatedness. The third person singular of the verb is pronounced (and spelled) without a final *s*. The difference seems to be syntactical. Practice in using the third person singular of the verb orally may aid in spelling correctly this verb by these Mexican-American youngsters.

Word 14, with, /s/ > f Substitution for Corpus Christi and t Substitution for San Antonio. Corpus Christi pronounced the word with a final /f/ and San Antonio with a final /s/. A dialectical (as well as syntactical) difference appears to be the reason why the samples pronounced and wrote the phoneme/grapheme differently. No other explanation occurs to the writer. Oral practice of words having a final /θ/ may help improve the spelling of this grapheme.

Word 15, cleans, /z/ < s Omission. The difference, for either sample, was not related between deviant modes at the .001 level of confidence. Spanish does not normally have a final /z/ sibilant similar to English. Practice orally with words having such a sibilant may help Mexican-American youngsters to spell better in English. Correspondence may be syntactical.

Word 16, David, /ey/ < i Addition. No attempt was made to relate, for either sample, a phoneme to a grapheme in this word because the phoneme in question was correctly rendered as to its spelling.

Word 17, David, /iy/ > e Substitution. The vowel in the second syllable was pronounced as a long e by San Antonio, and the spelling was with the letter e. As pronounced in the alphabet, the letter e has the sound of /iy/; perhaps this is the reason the youngsters spelled the sound with an e. In teaching the spelling of this word to Mexican-American children, the fact that the word is spelled the same in both languages should be brought up.

Word 18, washes, /iy/ > i Substitution. There does not appear to be relatedness in either sample (at the .001 level of confidence) between the pronunciation of the schwa in the second syllable of this word and its graphemic counterpart. The spelling, however, again seems to show that youngsters are spelling the /iy/ by using the letter which, in the alphabet, is similarly pronounced, the letter i.

Word 19, children, /iy/ = y Addition for Corpus Christi. There appears to be relatedness between the phoneme and the resulting iy spelling; however, it is difficult to extrapolate, on the basis of five percentage points, the reason for relatedness.

Word 20, children, /e/ Substitution. The vowel phoneme in the second syllable of the word is deviantly pronounced, especially by the San Antonio sample; however, the spelling of the corresponding grapheme is correct. This is an instance where practicing the standard phoneme would not appear to affect spelling.

Word 21, cleans, /iy/ > a Omission. There appears to be relatedness in pronouncing the vowel phoneme correctly, but in spelling the grapheme without an a for both samples (the difference for Corpus Christi, however, was not related at the .001 level of confidence). In spelling the word, apparently these youngsters do not hear the silent a and therefore do not write it.

Word 22, goes, /o/ Substitution < e Omission. There seems to be relatedness between the deviant phoneme and the misspelling which, in both samples, turned up as *gos. This is true for San Antonio but not for Corpus Christi. Perhaps oral practice of the standard pronunciation will aid in spelling this word.

Word 23, they, /e/ Substitution < a Substitution. Most of the youngsters pronounced the vowel phoneme in an acceptable way. Again, perhaps the Corpus Christi sample pronounced the a as it is pronounced in saying the alphabet. The way youngsters spelled the grapheme, this appears to be the case. This is one spelling that must be memorized, perhaps.

Tabulation of Deviancies

/z/ < s omission	4
/c/ < ch substitution	2
/s/ = f substitution	2
/b/ > substitution > v omission	1
/t/ > t substitution	1
/d/ < d substitution	1
/s/ > sh substitution	1
/s/ < s substitution	1
/s/ > t substitution	1
/ey/ < i addition	1
/iy/ > i addition	1
/iy/ > i substitution	1

Deviant Phoneme/Grapheme Relatedness, Spanish

Word 1, va, /v/ > b Substitution. There appears to be relatedness in pronouncing the deviant phoneme and representing it in writing with a *b*. No logical explanation occurs to the writer for this phenomenon. Oral practice of the /v/ and /b/ phonemes in English and of the Spanish allophone / ƀ / may help these youngsters in spelling in Spanish.

Word 2, baña, /v/ > v Substitution. There is relatedness in the way this phoneme is pronounced and spelled. Perhaps spelling is influencing phonology in this case; this phoneme is pronounced the same as the one in word 1. Oral practice in pronouncing this word may help in spelling it better.

Word 4, la, /∅/ > ∅ Omission. There appears to be sufficient relatedness in the way the phoneme/grapheme was omitted in this word. Perhaps the reason is to be found in baby talk that these Mexican-American youngsters may still be using. Oral practice of this sound in similar surroundings may help in spelling the word correctly.

Word 6, ayuda, /∅/ > a Omission. Many more youngsters omitted the initial sound in this word than omitted spelling the corresponding grapheme. Omitting the phoneme is probably due to baby talk on the part of these Mexican-American children. Oral practice may aid these children to better spell this phoneme/grapheme.

Word 7, están, /∅/ < ∅ Omission. Three times as many omitted the grapheme (than the corresponding phoneme) in this word. Omission of the phoneme is due to baby talk which, in turn, may affect its spelling. Oral practice of this phoneme in this environment may help in spelling it.

Word 8, los, /∅/ > ∅ Omission. Three times as many youngsters omitted the phoneme than left off the corresponding grapheme in this word. It is typical, for children speaking this dialect of Spanish to pronounce this word without the final /s/. The phonological omission carries over into spelling. Practicing the final /s/ in this and similar words may help Mexican-American youngsters such as these in spelling in Spanish.

Word 9, está, /∅/ < ∅ Omission. It is not uncommon, in the dialect these youngsters speak, to leave off the initial /e/ sound in this and similar words.

Omission seems to carry over into spelling. Oral practice of initial /e/ may aid these children to spell this word with greater accuracy.

Word 10, niños, /∅/ < ∅ Omission. Several dialects of Spanish, besides the one spoken by these Mexican-American children leave off the final /s/ in this word and others similar. The corresponding *s* grapheme is left off in spelling the word. Again, oral practice in pronouncing the final /s/ in this and similar words may help Mexican-American youngsters in spelling.

Word 11, vestir, /i/ > i Substitution. Four times as many youngsters substituted the /i/ than spelled it wrong. Even so, there appears to be relatedness between pronouncing the phoneme and spelling it in a similar manner. Oral practice which uses the correct pronunciation of the /e/ may help in its spelling.

Word 13, beben, /v/ > v Substitution. There seems to be relatedness in the way these youngsters pronounce the phoneme and in the way they spell the corresponding grapheme. The influence of phonology over graphemes seems apparent in this word. Oral practice in pronouncing the initial sound of this word should aid in spellit better for these youngsters.

Word 14, dientes, /Ø/< th Substitution. Omission of the initial sound in this word may be due to baby talk. The important thing seems to be that the youngsters spelled the sound with a *th* (which is not common to Spanish). It appears that English spelling is influencing Spanish spelling for these youngsters in this particular word. Spanish has an allophone [đ] which has a similar sound to the English *th*, but its spelling is with a *d*, which is what this word calls for.

Tabulation of Deviancies

/s/ < *s*	omission	3
/v/ > *v*	substitution	2
/v/ > *b*	substitution	1
/l/ > *l*	omission	1
/a/ > *e*	substitution	1
/e/ < *Ø*	omission	1
/i/ > *i*	substitution	1
/d/ < *th*	substitution	1

Words Showing Minor Deviancy Relatedness

Word 3, el, /i/ Substitution. Pronouncing the consonant as an /i/, making of the phonological manifestation a diphthong, may be due to baby talk. The grapheme, however was correctly spelled by all who attempted it. Spelling two or three-letter words, in either language, was not a problem for these Mexican-American children. Oral practice of the consonant in this environment may help these youngsters attempt to spell this word.

Words Having Minor Phoneme/Grapheme Deviances

Word 5, l*e*, /e/ Omission. Not pronounding the final vowel phoneme in this word is probably due to baby talk. The grapheme was correctly spelled by the majority of those attempting it. Between-modes relationship was not attempted in this word. Oral practice plus maturity of the child should help in pronouncing and in attempting to spell this phoneme/grapheme.

Word 12, p*i*erna, /i/ < i Omission. Not pronouncing the /i/ in this environment may be a sign of baby talk still present in these Mexican-American youngsters. Many more children left off the *i* in spelling, and perhaps this is evidence of English pronunciation upon Spanish spelling. In pronouncing, to themselves, the sounds of the letters needed for this syllable, it would be that youngsters pronounced the *e* as it is said when the alphabet is pronounced, with an /iy/ sound. This sound closely resembles the Spanish diphthong /ie/. Oral practice of this and other similar syllables may help these youngsters in their spelling.

Word 15, ellos, /j/ Substitution < s Omission. No attempt was made to relate deviant modes in this phoneme/grapheme, although substituting the /j/ may be construed as omitting the final /s/. No other explanation occurs to the writer for this phenomenon.

Questions Seven and Eight

To answer the questions, what is the influence of Spanish upon English phonology and spelling and, what is the influence of English upon Spanish phonology and spelling, a count was made of the kinds of phonological errors comitted by both samples. The fifteen spelling words chosen from the phonological assessment instrument contained graphemes which accounted for a corresponding 82 percent of the total mistakes in phonology. The kinds of grapheme errors committed by both samples were counted and compared.

The English /ð/ was pronounced as a /d/ in 22 percent of the phonological errors. This mistake is normal for a Spanish-speaking person using English. The English /š/ was replaced by the /č/ in 16 percent of the phonological mistakes. This mistake is also characteristic of a Spanish-speaking person using English. Fifteen percent of the phonological errors occurred when the final sibilant /z/ was replaced by the Spanish /s/.

Seventy-two percent of the Corpus Christi sample and 80 percent of the San Antonio sample failed to write the possessive grapheme in the word David's. This was the first word dictated by the tape in the spelling test. Eighteen percent of the San Antonio sample substituted the d grapheme for the th in spelling the word they. This substitution may indicate that Spanish phonology is influencing English spelling.

Forty-five percent left off the possessive final /z/ sibilant in the word David's. Again, this appears to be the influence of Spanish phonology because Spanish does not use a final sibilant to indicate possession.

Twenty-seven percent left off the /d/ in the /dz/ cluster in the words hands. Twenty-seven percent left off the d grapheme in the word hands. The final /z/ sibilant in the words washes and goes is left of 41 percent of the time, and in the word cleans is is left off another 33 percent of the time. The grapheme s or es corresponding to the phoneme is also left off a considerable number of times. The voiceless /θ/ in the words with and teeth is changed to /s/. In spelling, the th is replaced by the *s* grapheme a considerable number of times. The San Antonio sample pronounces the /z/ phoneme in *has* as an /f/ a considerable number of times. The Corpus Christi sample also substituted the /f/ phoneme for the /s/ in the word *has*. In addition, the San Antonio sample leaves off the *h* 18 percent of the time while attempting to spell the word *with*. Fifty-eight percent of the pupils in both samples pronounce the word *children* with an initial /š/. Both samples pronounce the Spanish word *chaqueta* (jacket) with an initial /š/ 6 percent of the time. In the spelling test, a significant number of each sample substitutes the graphemes *sh* in spelling the word *children*. The word *brush* is spelled with a final *ch* by both samples over half of the time.

To answer the question, what is the influence of English upon Spanish phonology and spelling, a count is first made of the phonological errors in Spanish. The fifteen spelling words given in the spelling test in Spanish contain phonemes in which 87 percent of the phonological mistakes occurred during the oral assessment in Spanish. Eighteen percent of the errors in Spanish phonology occur when the /b/ is pronounced as /v/. This substitution seems to be due to the influence of English phonology upon Spanish phonology. In addition, in the Corpus Christi sample, the written grapheme v appears as a substitute for the b a significant number of times. This substitution also seems to be the influence of English upon Spanish, but in this case it is in spelling rather than in phonology. In pronouncing the word baña, the Corpus Christi sample pronounced the /b/ as a /v/ significantly more times than did the San Antonio sample.

The /l/ in the word el turns into an /i/, and the syllable becomes a diphthong 9 percent of the time. This is one word in which 9 percent rather than 10 has been used as a criteria for selecting the word for the spelling test. The /l/ in the word la is changed to an /n/, and the result is perhaps baby talk, /na/ for la. Some indication of the influence of English phonology is found in the word le in which the /e/ is not clearly pronounced. It is slurred similarly to the schwa in a final unstressed position in English. This slurring of the /e/ occurred 22 percent of the time. Also, in an initial unstressed position, the Spanish /a/ became an /e/ like in /bet/ 16 percent of the time. This substitution may also be due to English phonological influence; it may also be due to immaturity on the part of the children.

The same holds for the word *están* in which the /s/ was not pronounced 17 percent of the time.

The influence upon Spanish spelling of the spelling in English may be seen in the way that 50 percent of the children spell the word *dientes* (teeth) with an initial *th* instead of the *d* (which at times is an apico dental fricative similar to the English /ð/). There is evidence that some children read Spanish words as if they were reading words in English. The English pronunciation of /v/ prompted 56 percent of the children to pronounce the word /va/ rather than /ba/ or /ƀa/. Eighteen percent of the Corpus Christi sample substituted a *b* for the *v* in the spelling test.

Omission of Word Category

The Omission of Word Category assures the inclusion, in each of the tabulations, of all pupils participating in the study. Thus the students who failed to respond in either mode are included, as are the ones who said and/or wrote the words. Here is the way that the samples fared as to word omission in both modes, oral and written.

1. In the word David's, more children omitted the written word than the oral.
2. In David, Corpus Christi got both modes correct. The San Antonio sample orally omitted the word 4 percent of the time. Eleven percent of the sample omitted spelling the word.
3. The word bed was not omitted in either mode by either of the sample groups.
4. The word they was omitted only once in each mode.
5. The word she was rendered correctly all of the time by both samples.
6. In the word hands, the Corpus Christi sample did not omit the word in either mode. Eleven percent of the San Antonio sample omitted the word in spelling.
7. In the word wash, 9 percent of the Corpus Christi sample omitted the word in spelling; none omitted the word orally. In the San Antonio sample, 2 percent omitted the oral rendition while 11 percent omitted the word in spelling.
8. In the plural word washes, none in the Corpus Christi sample omitted the word in either mode. In the San Antonio sample, 9 percent omitted

the word orally and none omitted the word in the spelling test. This does not necessarily mean that all spelled the word correctly.

9. In the word children, 9 percent in the Corpus Christi sample omitted the word orally; none omitted the word in spelling. None in the San Antonio sample omitted the word in either mode.
10. In the word brush, the Corpus Christi sample did not omit the word in either mode. In the San Antonio sample, 6 percent omitted the word orally while 11 percent omitted the word in the spelling test.
11. The word teeth was correctly rendered in both modes by the two sample groups.
12. In the word has, 9 percent of the Corpus Christi sample omitted the word in spelling. The San Antonio sample got the word correct in both modes.
13. The word with was not omitted in either mode by the Corpus Christi sample; however, 2 percent in the San Antonio sample omitted the word orally and 4 percent omitted the word in the spelling test. Even though Table 20 shows what

appears to be a relationship between modes for each sample the results of a test of proportions show otherwise. Apparently the pupils who mispronounced the phonemes during the assessment were not the same pupils who misspelled the corresponding graphemes during the spelling test.

14. In the word cleans, 4 percent of the Corpus Christi sample omitted the word orally; none did so in the spelling test. In the San Antonio sample, none omitted the oral rendition, while 11 percent omitted the word in spelling.

15. In the word goes, 4 percent omitted the word orally and 9 percent omitted the word in the spelling test in the Corpus Christi sample. Four percent omitted the word orally and only 2 percent omitted the word in the spelling test in the San Antonio sample.

In the Spanish part of the test, the San Antonio sample did better than the Corpus Christi sample in the phonological assessment. This better performance includes the category of word omission in the oral mode. The San Antonio sample also attempted more words in both modes: no words were omitted during 60 percent of the Spanish test.

Seven percent in the San Antonio sample did not orally attempt the words la and va, and only 2 percent failed to attempt the words pierna, beben, and ellos. Four percent failed to attempt the word dientes (teeth). Perhaps one reason why the San Antonio sample attempted more words in Spanish is because their school instruction is through English only, and using Spanish is a novelty to them.

In the Corpus Christi sample, the least number of pupils that failed to attempt to write a word was 9 percent. This happened in the words la, están, vestir, pierna, and va. The Corpus Christi sample omitted the words significantly more times than the San Antonio sample. This happened during the oral rendition of eight words and once during the spelling of one word. These words are, in the oral mode, el, la, ayuda, están, los, está, niños, and vestir; in the spelling test it was dientes.

The reason that the Corpus Christi sample shows consistently more pupils failing to attempt words in Spanish may be due to the pupils whose papers had to be included in the tabulation. Initially, 2 of the 24 pupils had to be eliminated due to defective phonological assessments. Also, two other students were counted who attempted only three words each during the oral test, and two more who only wrote three words during the spelling test. These three account for 14 percent in each mode.

Summary

The two samples, Corpus Christi representing bilingual instruction and San Antonio representing monolingual instruction were compared as to phonological and spelling scores. This comparison was done in the first analysis; there is no significant difference between samples as to phonological scores and spelling scores. See Tables 10 and 11.

Next, the samples were compared as to the effect of sex on phonological and spelling scores. This analysis was done within groups. Although the girls scored higher than did the boys, the difference between score means was not significant. See Tables 12 and 13.

The third analysis studied the language of the home as a variable in comparing phonological and spelling scores. Again, comparison was made within samples and home language was determined by the language used by the parents in ordinary conversation at home. Although the group having both parents speaking English at home scored higher than the other two groups, the difference between score means was not significant. See Tables 14 and 15.

The fourth analysis dealt with the number of siblings at home as a variable in phonological/spelling scores of both samples (Tables 16 and 17). When comparison was made within groups, there was no significant differences whether the child came from a small family, a medium-sized family, or a family having from seven to ten siblings. In a subsequent analysis, where both samples were combined, the results favoring fewer siblings were significant in three out of four analyses (see Table 18). In the analysis of the Spanish phonological scores the results favored children having the largest number of siblings. The difference between groups was significant when phonological score means were compared. See page 101.

Spelling errors were classified as rational or irrational for the purpose of this comparison between samples (see Table 19). The largest percentage of errors in the Corpus Christi sample occurred in the rational omission category; the San Antonio sample's largest number of errors occurred in the irrational omission category. The difference between score means was not significant.

In comparing the phoneme/grapheme relationship between and within samples, both samples made higher scores in the phonological assessment than in the spelling tests (see Table 20, oral correct vs. written correct 1-23). In the Spanish phoneme/grapheme comparison, the Corpus Christi sample scored higher in spelling than in the phonological assessment, although not significantly higher. See Table 21, words 1-15.

It appears that, for these Mexican-American bilinguals, Spanish phonology has a much greater influence upon English phonology and spelling than English has upon Spanish phonology and spelling.

Twelve percent of the phonological errors selected for this study involved the final sibilant /z/ being rendered as /s/ by both samples. Spanish phonology appears to be influencing English phonology, because in Spanish the final _s_ or _z_ is pronounced as /s/, not as /z/. On the other hand, the English /ð/ was replaced by the /ɣ̌/ in 16 percent of the phonological mistakes made by these Mexican-American youngsters.

The Spanish word _dientes_ (teeth) was spelled with an initial _th_ 50 percent of the time by Corpus Christi. The influence may be from English spelling because there is no /ð/ phoneme in Spanish spelled with _th_.

By including an Omission of Word Category, all the children have been included in the tabulation, even the ones not answering orally or in the spelling test. More attempts were made at answering orally during the phonological assessment than during the spelling test. The Corpus Christi sample omitted less words in English; the San Antonio sample omitted less words in Spanish. In neither language were the results significant as to one sample outperforming the other in the omission of word category.

Of the total phonemes analyzed, 65 percent were consonants and 35 percent were vowels. More mistakes were committed in pronouncing the consonants than in pronouncing the vowels. Furthermore, more mistakes were committed in spelling the consonant graphemes than the vowel graphemes. However, the kinds of spelling errors were three times as many in spelling vowels than in spelling consonants.

CHAPTER V

SUMMARY, LIMITATIONS, CONCLUSIONS AND RECOMMENDATIONS

Summary

This study compares the relationship of pronunciation to spelling, in English and in Spanish, for a group of Mexican-American second graders in Corpus Christi and San Antonio, Texas. The public schools from which the two samples were drawn are located in educationally, economically, and culturally similar neighborhoods (although different from the rest of the community) within each of the two cities.

A second aspect of this research compares the type of instruction, bilingual or monolingual; the former is represented by the Corpus Christi sample, the latter by the San Antonio sample. The need to know the relationship that speech has to spelling, particularly in the dialect of Mexican-American bilingual children, prompted this study and this design.

The Gloria and David Oral Bilingual Test--Spanish-English was used as the assessment instrument.

The test makes use of a television-like receiver which a child watches as he repeats the utterances in English and in Spanish that are spoken by a bilingual woman who speaks a standard dialect in both languages. As the pupil repeats the sentences, a recording is made of his voice for future analysis.

The investigator selected seventy-eight children from ten classrooms in five participating schools: Storm and Brewer schools in San Antonio, and Lamar, Lozano, and Zavala schools in Corpus Christi, Texas. The investigator selected a minimum of six children, three boys and three girls, from each of four second grade classrooms in Storm and Brewer schools, and from each of four Follow Through classrooms in Lamar, Lozano and Zavala schools. Inferior quality of recordings and absences during the spelling test reduced the number to sixty-seven, forty-five in 7 classrooms in San Antonio and twenty-two in 4 classrooms in Corpus Christi, Texas.

Fifteen words in English, plus an additional fifteen words in Spanish for Corpus Christi made up the spelling test based upon the following criteria: In each word selected, both English and Spanish, there was at least one phoneme which had been mispronounced 10 percent or more of the time by both samples combined. The spelling test was taped; the voice on the tape and the protocol used were both taken from the tape originally used during the oral language assessment. In every instance the entire class took the spelling test, but only the test papers of the children chosen for the assessment were selected for this study.

The investigator scored the phonological test in two ways. First, a count was made of all the phonological deviations made by each sample. Next, a count was made of the number of deviations committed by each sample out of a total of the fifteen specifically-selected words which were mispronounced 10 percent or more of the time by both samples combined.

The investigator scored the spelling test in two ways. First, a count was made of all the spelling deviations made by each sample. The deviations, classified as being rational (gose for goes) or irrational (futr for goes), were designated as deviations of addition, omission, or substitution. This classification is explained in Chapter III, page 79.

Second, a score was given on the spelling of fifteen specifically-selected graphemes. The words in

English contained graphemes corresponding to phonemes which had accounted for 82 percent of the phonological deviations during the assessment. The words in Spanish contained graphemes corresponding to phonemes which accounted for 86 percent of the phonological deviations in both samples combined. For example, the grapheme b was written as a v a significant number of times. Not included in this tabulation were omitted and irrational words.

Limitations of the Study

Subjects, instrumentation and testing procedures

1. Eleven subjects in both samples were eliminated either because of poor quality of recording during the phonological assessment, or because of being absent from school during the spelling test. Due to restrictions of time and money it became impossible to go back and test the Ss who missed taking the spelling test.
2. Perhaps if more care could have been exercised as to the capability of the Ss as to their being able to spell, the high frequency of omission of

words, in English as well as in Spanish, would have been lessened.

3. Prior to taking the phonological assessment, no measure of verbal ability was used to determine the degree of oral proficiency that each subject had.
4. Also, no comparison between the scholastic rank of the Ss and their ability to speak and to spell was obtained though the validity of such a comparison at this level may well be questionable.
5. Copying was not a major problem during the test. Before the spelling test was given the Ss were told to keep their eyes on their own paper. The fact that the machine was dictating the words permitted the investigator to move about the room while the test was being taken.
6. The Teaching Assistant used with the San Antonio sample for the phonological assessment was not used with the Corpus Christi sample.
7. The relationship between phoneme and grapheme is not equated to cause.
8. The phonological assessment entailed making determination about sounds created in code-switching between English and Spanish.

9. You cannot reliably prescribe from a single incidence; consequently, a relationship between phoneme/grapheme, at times, was not attempted.
10. Environment affects the sound of Spanish vowels and consonants. A word in isolation, e.g., when it is dictated in a spelling test, may be pronounced differently when it is used in a sentence, e.g., in the sentences used in the spelling test. This is true of /b/, /d/, and /g/ when they are preceded by silence vs. when they are preceded by a vowel. This factor may have affected spelling in Spanish for the Corpus Christi sample.

Instructional aspects.

1. Information as to amount of time devoted to the teaching of spelling in English was obtained by having the teachers orally answer questions about time allotments for spelling.
2. The spelling instruction that both samples were engaged in contained a measure of practice on phoneme/grapheme correspondence; the textbook used provides a linguistic approach to learning spelling.

3. In one classroom in San Antonio, a substitute teacher was on duty when the spelling test was given. This may have affected the outcome of the score in the spelling test for the class.

Socioeconomic factors. The Ss in both samples are from what could be described as low-income families, and they both belong to the same culture group.

1. However, whereas the San Antonio sample is mostly living in federal housing apartments, the sample in Corpus Christi lives in modest one story houses.
2. No knowledge about the educational attainment of the parents of the subjects is available; however, it appeared that more in San Antonio than in Corpus Christi come from families where one or both parents speak English at home.

Generalizability of the findings.

1. The fact that Ss had to listen to a tape dictating a spelling test plus the fact that the voice on the tape was not the teacher's may have altered the outcome.
2. At least one word, David's, occurred only once, and then at the very beginning of the spelling

test. No sample words were given. This phonological factor may have been a weakness in the test, because it was in this word that the biggest difference occurred between correct pronunciation and correct spelling.

Conclusions

The following conclusions may be drawn on the basis of the findings modified by the limitations explained above for both samples:

1. The sample involved in bilingual instruction did significantly better in English phonology in a repetition exercise than did the sample involved in monolingual instruction where only English is used.
2. The finding that the bilingual sample was more rational in its spelling errors may indicate a certain awareness for phoneme-grapheme relationship because, in the learning process, the sounds of one language are contrasted to the sounds of the other language.
3. The influence of Spanish was greater on English phonology than on English spelling. English

influence is evidenced in Spanish phonology, although to a lesser degree.

4. The San Antonio sample pronounced the Spanish /b/ in baña, the /e/ in le, and the initial /a/ in ayuda significantly better than the Corpus Christi sample. Perhaps the novelty of using Spanish as a medium of instruction prompted the youngsters in the San Antonio sample to try harder during the phonological assessment.
5. Oral-to-written relatedness was found in half of the vowels analyzed and in two-thirds of the consonants analyzed. A significant phoneme/grapheme correct relationship was found 65 percent of the time in English for Corpus Christi and 48 percent of the time in the San Antonio sample.
6. The most oral-to-written correspondence in the consonants occurred in the omitted final /z/ sibilant to the final s grapheme in washes, goes and has. In the vowel phoneme/grapheme relationship, the most correspondence occurred between the schwa and the e grapheme in the second syllable in washes.

7. In Spanish, Corpus Christi sample only, oral-to written correspondence occurred in the /l/ phoneme and *l* grapheme in words *el* and *la*.
8. For the most part, both samples committed the same pronunciation mistakes. However, the test of proportions indicates a positive relationship 56 percent of the time between correct pronunciation and correct spelling.
9. There seems to be relatedness between phonological differences and spelling deviations. There is a 43 percent relatedness in the San Antonio sample and a 35 percent relatedness in the Corpus Christi sample between deviant phonemes/graphemes. Relatedness was manifest in the deviant pronunciation and spelling of the initial voiced /ð/ as in *they*, and in pronouncing and spelling the final voiceless /θ/ as in *teeth* and *with*. *They* was pronounced and spelled with a /d/ and a *d*; *teeth* was pronounced and spelled with /s/ and *s*. *With* was pronounced with a similar deviancy by both samples but with different spellings: *_wif_ by Corpus Christi and *_wit_ by San Antonio. /č/ and /š/ phonemes and their

corresponding ch and sh spellings were used interchangeably in such words as wash, brush and children. Deviancy in pronouncing final /d/ in bed and initial /š/ in she did not seem to affect the correct spelling of either word, probably because both words are short and easily learned in spelling lessons.

10. The number of siblings appears to correlate with oral production as well as on spelling. If a youngster has fewer siblings his score is better in English. Perhaps this child comes from a younger family where the parents speak English at home.
11. The variable of sex does not appear to have a bearing either in phonology or in spelling.
12. Method of instruction does not appear to have a bearing on spelling test scores. Findings are inconclusive as to the advantage of bilingual instruction over monolingual instruction or vice versa as far as spelling is concerned.
13. The instructional factor that may have affected the scores in phonology and in spelling is the fact that English is taught initially in the aural-oral approach in bilingual classes.

14. Other factors besides the variables of sex, age, home language, number of siblings, and type of instruction may have influenced test results. The aides and ancillary services available to the Ss in the bilingual classes may have contributed to the performance during the phonological and spelling tests.
15. Some oral differences were not reflected in spelling deviations. Words such as bed and she were correctly spelled in spite of their having been mispronounced.

Suggested Recommendations Based on the Findings and Limitations

1. Use bilingual instruction in teaching Mexican-American children whose home language is a dialect of Spanish. Indications are that they have better pronunciation in English, perhaps because they learn English as a second language through ESL methodology.
2. The findings indicate that the sample taking bilingual instruction committed spelling errors that were considered more rational: even though

they were errors, the spelling still closely resembled the word correctly spelled, e.g., Dabid for David. By learning how to read and write in Spanish first the student may become aware of closer phoneme/grapheme relationships and thus transfer this learning when it is time to learn how to read and spell in English.

3. The phonological influence of Spanish is manifest in both groups in their pronunciation of English. Provide pupil practice in oral English several times during the school day, by using pattern practice type of exercises. If possible, have an Anglo teacher or a recording be the model for the pattern practice sessions in English.
4. Use bilingual instruction both to give the bilingual pupil a broader base from which to start formal schooling, and as an option so that he may be allowed to make a choice as to the culture group(s) he wishes to be a part of.
5. There seems to be three times as much variation in spelling vowel graphemes in comparison to spelling consonants. Vowels are, therefore, in the majority and consonants are in the minority

as to types of spelling errors. Spelling programs for Mexican-Americans should concentrate greater effort in providing more practice that may aid students in mastering the spelling of vowel graphemes, e.g., practicing the spelling of long and short vowels, e.g., bit-bite, sit-site.

6. More oral repetition of new spelling words by pupils should enhance the possibility of correctly spelling the new words. Oral repetition, besides having pupils write misspelled words X number of times, for example, may aid pupils in increasing the proficiency of spelling long vs. short vowels, because these youngsters have trouble distinguishing them orally to begin with.

7. The San Antonio and Corpus Christi samples appear to have a [v] allophone of the /b/ phoneme which does not appear to be different from the English /v/. In teaching Spanish, it would appear difficult to teach words such as baña (bathes), which in Spanish is pronounced with a /b/ or its [ƀ] allophone, but which these children have a tendency to pronounce with a [v].

8. There seems to be a positive relationship between pronouncing in a standard dialect and spelling words correctly. Having students orally practice a standard dialect of both languages may better their chances of being able to spell better in the two languages.
9. Analyses indicate a relationship between phonological deviances and spelling errors in both languages, English and Spanish. Oral practice of minimal pairs containing such phonemes as the final /z/ sibilant as in *goes*; the voiced /ð/ as in *they* and the voiceless final /θ/ as in *teeth* and *with*; and contrastive drills of /č/ and /š/ may help Mexican-American youngsters to spell better in English. Similar oral exercises in Spanish may improve the pronunciation of such deviancies as *vistir for vestir in Spanish. Youngsters should be graded on oral production as well as on written tests. They may become more aware of the way they must speak if they know they will be evaluated on standard oral language production, too.
10. Have teachers identify children who have several siblings, so as to allow for their working in

small groups, thereby allowing the teacher to work more closely with them in verbal interaction.

11. Grouping according to sex does not appear to be necessary among these Mexican-American youngsters. Although girls outperformed boys in certain tests, the findings were not conclusive and grouping should be on other bases.
12. The sample involved in bilingual instruction scored higher in English phonology. Although the English and Spanish spelling tests scores were higher, the results were inconclusive. These data suggest that bilingual instruction be continued because, better prepared and more experienced teachers, coupled with adequate teaching materials may make this method significantly better than monolingual instruction for these Mexican-American youngsters.
13. By encouraging pupils to repeat orally the new spelling words, the chances of their spelling them with a higher degree of correctness may be enhanced as shown by the way their pronunciation improves.

14. Refine the phonological assessment instrument so as to include several of the phonemes which are missed most often in ordinary conversation. Some phonemes difficult for these Ss to pronounce appear in difficult environments only once; they should appear several times, e.g., the /z/ in the word David's.

APPENDICES

APPENDIX A

TAPED SPELLING TESTS IN ENGLISH AND IN SPANISH

APPENDIX A

Taped Spelling Tests in English and in Spanish

English Time: 6 minutes

The word will be said once, then it will be used in a sentence. When the word is repeated after the sentence, you spell it on your paper.

1.	washes	Mother washes David's neck.	washes
2.	has	David has a toothbrush.	has
3.	teeth	He cleans his teeth with his brush.	teeth
4.	goes	Daddy goes to work.	goes
5.	bed	The children go to bed.	bed
6.	cleans	He cleans his teeth with his brush.	cleans
7.	brush	David has a brush for his hair.	brush
8.	wash	The children wash their hands.	wash
9.	with	He cleans his teeth with his brush.	with
10.	David's	Mother washes David's neck.	David's
11.	they	Today they go to school.	they
12.	she	She washes his ears.	she
13.	children	The children go to bed.	children
14.	David	Mother wakes Gloria and David.	David
15.	hands	The children wash their hands.	hands

Spanish Time: 6 minutes

1.	el	Ella tiene el jabón.	el
2.	la	Tiene jabón en la nariz.	la
3.	los	Se lava los dientes.	los
4.	Ellos	Ellos van a la escuela hoy.	Ellos
5.	beben	Gloria y David beben la leche.	beben
6.	niños	Los niños despiertan al bebé.	niños
7.	le	El jabón se le metió en los ojos.	le
8.	está	La luz está apagada.	está
9.	va	Papá va a trabajar.	va
10.	dientes	Ellos se lavan los dientes.	dientes
11.	ayuda	Mamá le ayuda a Gloria.	ayuda
12.	pierna	El bebé tiene un calcetín en la pierna.	pierna
13.	están	Los niños están de rodillas.	están
14.	vestir	Los niños se pueden vestir solos.	vestir
15.	baña	Gloria se baña.	baña

3 OF 3

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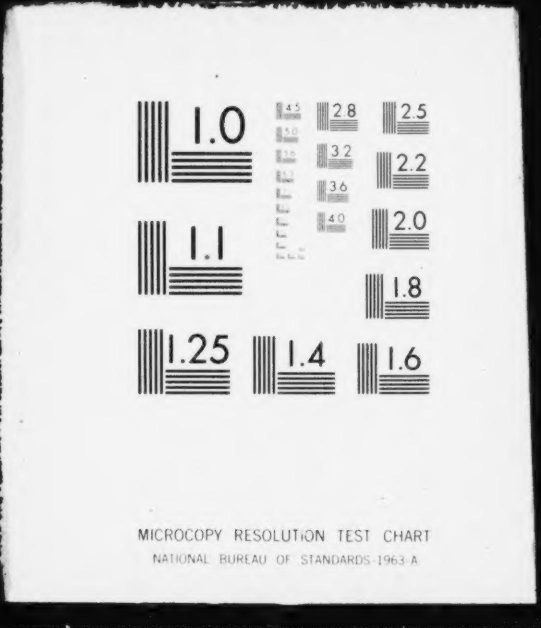
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

APPENDIX B

THE SPANISH AND ENGLISH TEST IN PHONEMIC NOTATION

3

THE SPANISH AND ENGLISH TEST IN PHONEMIC NOTATION

1. /məðər wašəz deyvidz nek/
2. /šiy wašəz hiz iyrz/
3. /glořiə se baña/
4. /eya tiene el xabon/
5. /gloriə wašəz hər heyr/
6. /eya tiene xabon en la kabesa/
7. /gloriə crayz/
8. /glořia yořa/
9. /el xabon se le metio en los oxos/
10. /sowp iz an hər nowz/
11. /tiene xabon en la nařis/
12. /məðər helps gloriə/
13. /mama le ayuda a glořia/
14. /deyvid haəz a tuwθbrəš/
15. /hiy cliynz hiz tiyθ wiθ hiz brəš/
16. /glořia tiene un sepiyo de dientes/
17. /se lava los dientes con su sepiyo/
18. /ðey r an ðeyr niyz/
19. /estan de řodiyas/
20. /ðə čildrən gow tuw bed/
21. /los niños se akwestan/
22. /ðə liyt iz not an/

23. /la lus esta apagada/

24. /məðər weykz gloriə ænd deyvid/

25. /los niños despieřtan al bebe/

26. /gloriə ænd deyvid bowθ get clyn clowz/

27. /eyos se pweden vestiř solos/

28. /david pwede abotonarse la camisa/

29. /gloriə cænɔt bətən hər dres/

30. /ðə soks r an gloriəz fiyt/

31. / glořia tiene sus sapatos/

32. /beybiy hæz ə sók an hiz leyg/

33. /el bebe tiene un kalsetin en la pieřna/

34. /glořia tiene un peine pařa el cabeyo/

35. /deyvid hæz ə brəš for hiz heyr/

36. /ðə fæməliy iyts brekfəst/

37. /la familya se desayuna/

38. /gloriə ænd deyvid drink milk/

39. /glořia i david beben leče/

40. /ðə čildrən waš ðeyr hændz/

41. /ðey brəš ðeyr tiyθ/

42. /eyos se laven los dientes/

43. /deyvid getz ə litəl cowt/

44. /david toma una čaketa/

45. /tuwdey ðey gow tuw skuwl/

46. /eyos van a la eskwela oy/

47. /dædiy gowz tuw wərk/

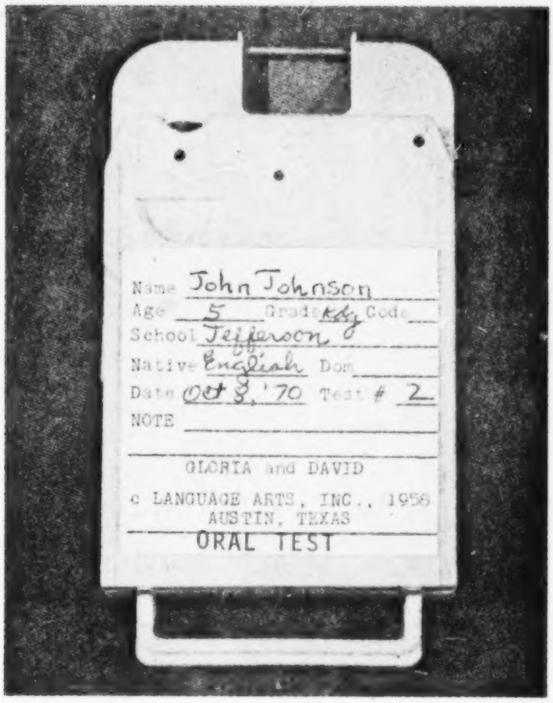
48. /papa va a trabaxar̃/

49. /məðər wərkz æt howm/

50. /mama trabaxa en casa/

APPENDIX C

THE TEACHING ASSISTANT



Name John Johnson
Age 5 Grade Kdg Code
School Jefferson
Native English Dom
Date Oct 8, '70 Test # 2
NOTE

GLORIA and DAVID

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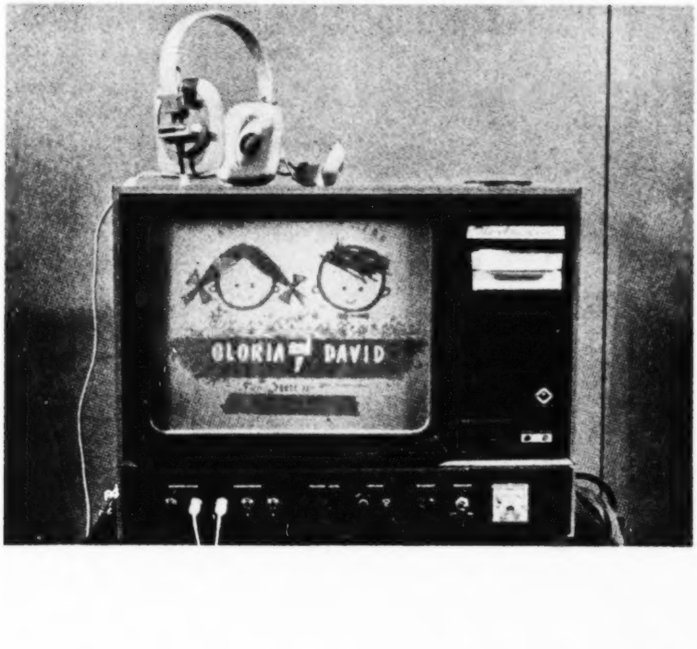
AUSTIN, TEXAS

ORAL TEST



APPENDIX D

SCORING SHEET AND EVALUATOR'S INTERPRETATION FOR THE GLORIA AND DAVID ORAL BILINGUAL TEST - SPANISH-ENGLISH

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APPENDIX E

INSTRUCTIONS FOR ADMINISTERING THE GLORIA AND DAVID TESTS

3.4.3 Administration procedure. Each child is seated before the ASSISTANT which is placed on a table top so as to position the screen at eye level. The child's name is recorded on an adhesive-backed label which is affixed to the sound cartridge (cf. Figure 3.1), and the latter in turn is joined to the picture cartridge. The child is provided with an earphone-microphone headset, and an attempt is made to allay any doubts or fears the child may have concerning the headset. The headset is positioned comfortably on the child's head with the microphone about three inches from his lips. The child is asked to repeat during the time allotted the sentences provided by the model (e.g., "Say what the lady says."). The combined audio-visual cartridge is inserted in the machine and the start button depressed. The record button is then depressed and the recording light checked. Record volume for the child's response and the playback volume on the model test, although normally preset before a series of test administrations, are verified. The first two frames (i.e., four sentences, two illustrations) are monitored by the administrator to verify that the child understands what he is being asked to do. This monitoring also permits the administrator the opportunity to check on the synchronization of the audio and visual stimuli as well as to readjust the volume for the child's responses. This last readjustment is occasionally necessitated because of the wide variation in the levels of children's responses. The most efficient means of setting the child's volume control has been to set the record volume at peak and reduce to below distortion level.

Once the child has begun his task and all adjustments have been made, the test administrator withdraws from the immediate area. Since the illustrations change automatically and the machine turns itself off at the end of the test, there is no need for more than infrequent cursory checks from a distance. Most children do not experience difficulty in understanding what is expected of them after the administrator has provided them initial instructions accompanied by encouragement during the monitoring of the first four sentences.

When the test has been completed and the machine stops, the administrator returns to the testing area, removes the headset, and praises the child for his efforts. The double cartridge is removed from the machine and the audio tape with the child's identification label affixed is separated from the film cartridge. The former is set aside for subsequent evaluation and the latter may be affixed to a blank audio tape cartridge for the next child. The same picture cartridge thus may be used repeatedly by substituting the audio cartridges for successive children. Total testing time is approximately eight minutes for the English test and eight and one-half minutes for the Spanish-English test.

Instructions taken from "Repetition as an Oral Language Assessment Technique," Diana S. Natalicio and Frederick Williams, The Center for Communication Research, The University of Texas at Austin, March, 1971.

APPENDIX F

DATA USED ON TEST OF PROPORTIONS

DATA USED ON TEST OF PROPORTIONS FOR DETERMINING RELATIONSHIPS BETWEEN MODES,

CORPUS CHRISTI AND SAN ANTONIO, TEXAS, 1973

Word from Table 22	Right Phoneme Right Grapheme		Wrong Phoneme Right Grapheme		Right Phoneme Wrong Grapheme		Wrong Phoneme Wrong Grapheme	
	Corpus Christi	San Antonio	Corpus Christi	San Antonio	Corpus Christi	San Antonio	Corpus Christi	San Antonio
1. David's	14%	2%	0%	0%	63%	65%	23%	33%
2. she	41	60	50	34	9	2	0	4
3. washes	45	41	9	27	14	16	32	16
4. has	59	49	14	31	27	4	0	16
5. cleans	50	34	4	16	36	42	9	8
6. with	50	58	23	20	23	20	4	2
7. bed	91	74	0	20	9	4	0	2
8. children	32	38	36	26	14	24	18	12
9. David	73	87	27	2	0	0	0	11
10. brush	55	20	0	2	41	51	4	27
11. wash	68	51	0	11	27	25	5	13
12. teeth	68	40	5	20	23	31	4	9
13. hands	78	42	4	9	14	40	4	9
14. they	64	42	4	22	23	20	9	16
15. goes	50	45	4	18	32	24	14	13
16. David	63	75	5	2	28	22	4	1
17. David	41	36	9	20	50	13	0	31
18. washes	37	20	27	51	13	0	23	29
19. children	63	34	27	62	10	4	0	0
20. children	54	53	14	36	32	0	0	11
21. cleans	50	40	0	22	36	29	14	9
22. goes	31	43	10	22	59	33	0	2
23. they	72	94	10	2	18	4	0	0

APPENDIX G

ADDITIONAL VOWEL TESTS

These tables represent a study made of spelling of nonsense words plus the remaining words in the original phonological assessment which contained vowel phonemes deviant enough to warrant closer study but which were not part of the original spelling test. Eight words were given in a spelling test to a group of thirty-one youngsters attending summer school in Title I schools in Corpus Christi, Texas, on July 24, 1972.

Of the eight words from the original assessment given in the test, one word (home) was spelled correctly by all of the children, with another word (they) spelled correctly by all but two of the children. The words his and leg were spelled correctly by 25 children, while the word little was spelled correctly by 20 children. The children appeared to have difficulty with the words knees and family; family was spelled correctly by 11 children, but no child spelled knees correctly.

The first syllable in family is spelled correctly for the most part. The pupils had trouble in the middle and final syllables, although most of them wrote the final y.

The word drink was spelled correctly by the third grade class; the two second grade groups had trouble with the word.

Frequency Count Table

This table lists eight words that were dictated as a spelling test to thirty-one second and third grade pupils attending Follow Through summer school classes in Corpus Christi, Texas, on July 24, 1972. There were eighteen pupils in one third grade class and there were two second grade classes, one with six and one with seven students. The count on the different spellings is listed under each word.

they		his		leg		drink		little		knees		family		home	
they	29	his	25	leg	25	drink	21	little	20	nes	5	family	11	home	31
thea	1	hes	2	lag	3	drinck	1	littel	5	neas	3	famali	2		
there	1	is	2	lage	2	drick	1	lettl	1	nees	3	famaly	2		
		he	1	lak	1	dre	1	litter	1	nies	2	falay	1		
		hos	1			drek	1	litte	1	nis	2	famaily	1		
						ding	1	littk	1	kneece	1	faimaly	1		
						dink	1	leittel	1	knee	1	famaliy	1		
						dorik	1	ellet	1	keens	1	flainy	1		
						dricin	1			knen	1	famialy	1		
						tak	1			knese	1	famul	1		
						tric	1			nease	1	famailiy	1		
										neces	1	famale	1		
										needs	1	famle	1		
										neez	1	famy	1		
										neeze	1	famely	1		
										nese	1	famly	1		
										neses	1	famie	1		
										ness	1				
										nise	1				
										niz	1				

Frequency Count Nonsense Words

The following lists the third grade students and the manner in which each one spelled the ten nonsense words. This is a frequency count of the way the words were spelled by the third grade class as a group.

/hiyf/		/gliŋ/		/bing/		/wʌg/		/tæs/	
hife	4	gling	5	bing	7	wood	1	tas	10
hif	4	glin	5	bin	2	w[illegible]g	2	task	2
heaf	3	clean	1	bege	1	wos	2	pass	1
hef	3	cleen	1	begn	1	woog	1	tase	1
heath	2	clen	1	ben	1	wook	1	tased	1
hib	1	gleen	1	bene	1	wool	1	tass	1
hisf	1	clen	1	beng	1	woold	1	tast	1
		gleen	1	bi	1	woug	1	tos	1
		glen	1	bran	1	wug	1		
		gline	1						
		gling	1						
		glink	1						

/bad/		/næz/		/mat/		/niz/		/kæž/	
bod	7	nase	6	mot	10	nes	3	cash	6
boas	3	nace	2	mout	2	muze	2	catch	5
boud	3	maze	2	mut	2	nis	2	cach	4
bad	1	naze	1	moot	1	neze	2	catchese	1
boughd	1	nas	1	mought	1	niz	2	cazh	1
bought	1	nass	1	moute	1	mieze	1	tach	1
bud	1	naz	1	mod	1	neeze	1		
but	1	nazed	1			nege	1		
bwd	1	neas	1			neged	1		
		nese	1			nese	1		
		nose	1			nez	1		
						niece	1		

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